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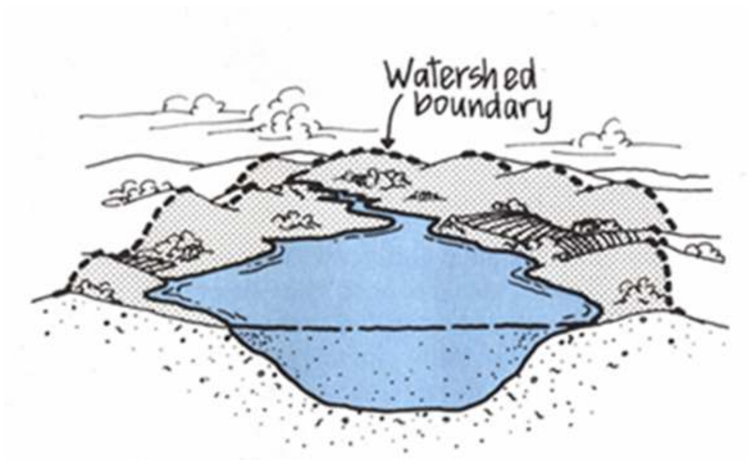
1. Introduction

Watershed planning is a public process involving all parties with an interest or "stake" in the environmental health and quality of life of the area at issue. A watershed, the land area from which precipitation and resulting surface runoff drain to a lake or river, serves as the organizational framework for thinking about, planning, and managing land use and other activities that affect both land and water resources.

Figure 1. Watershed boundary schematic.

A watershed is the land area from which rainwater and snowmelt drains into a body of water such as a stream or lake. Watershed boundaries are defined by nature and are largely determined by the surrounding topography or "lay of the land."

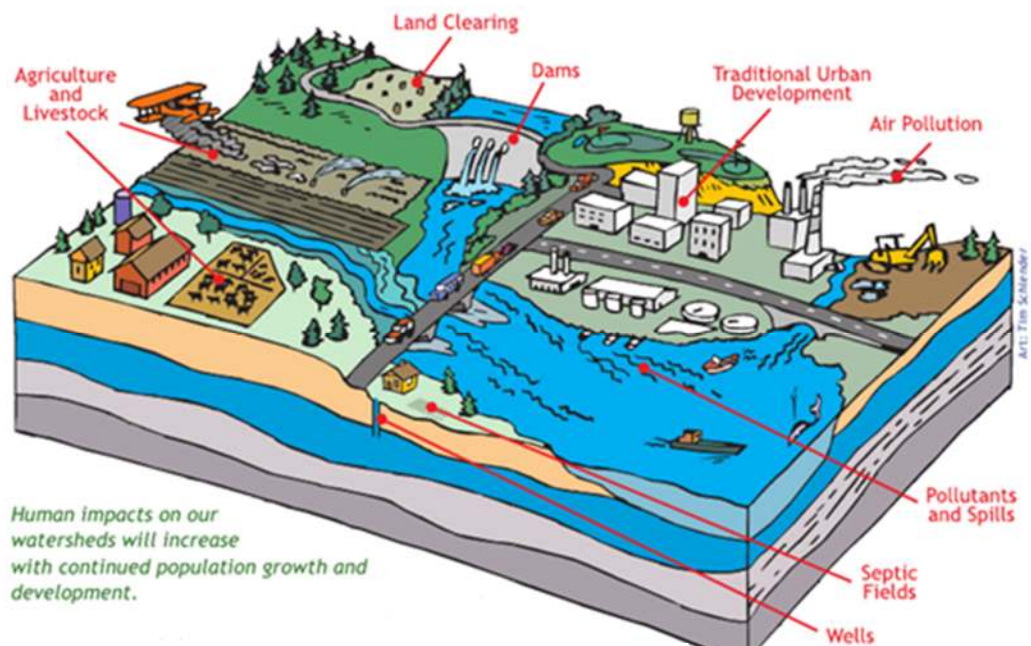


Everyone lives in a watershed, and smaller watersheds are nested within increasingly larger ones since water runs downhill. Thus, watershed boundaries are defined by topography or the "lay of the land." Human activities within the watershed affect local water quality and the waters of their downstream neighbors. While watersheds grow in spatial extent when one stream joins with one another, watersheds typically end when a river drains into the ocean, large lake, or, more rarely, an inland point such as a relatively low lying wetland that serves to recharge groundwater.

Watershed planning is commonly driven by the need to correct water pollution problems in streams and/or lakes. Planning can also focus on protecting water resources that are not impaired by any number of potential sources and causes of pollution that typically stem from land-use change or land-management activities that do not fully account for off-site impacts. When remedy for water pollution is sought, it is usually made possible by funding that stems from the Clean Water Act.[1] Such is the case with this plan.

[1] Federal Water Pollution Control Act of 1972 (Public Law 92-500) as amended, also known as the Clean Water Act.

Figure 2. Human impacts on watersheds.



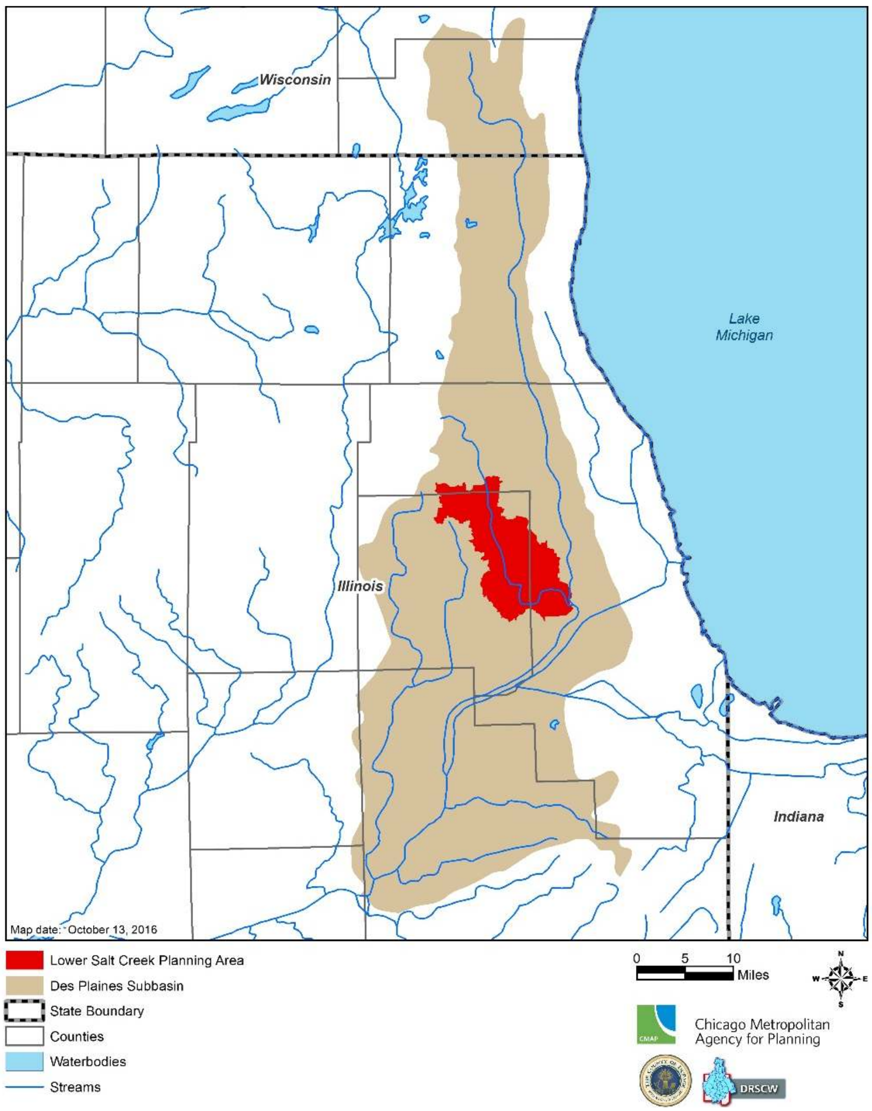
Source: Washington Dept. of Ecology

The Chicago Metropolitan Agency for Planning (CMAP) received a Clean Water Act grant from the Illinois Environmental Protection Agency to develop a watershed-based plan for the Lower Salt Creek Watershed located in eastern DuPage County and western Cook County in northeastern Illinois (Figure 3). CMAP partnered with DuPage County Stormwater Management and the DuPage River Salt Creek Workgroup to prepare this plan and work with local stakeholders to develop recommendations that upon implementation will help restore and protect the water quality of Salt Creek and its tributaries that ultimately drain to the Des Plaines River. This plan follows U.S. EPA and Illinois EPA watershed-based planning guidelines since it is made possible by Clean Water Act funding.

2. Lower Salt Creek Watershed Planning Area

The Lower Salt Creek Watershed planning area lies within the Des Plaines River Subbasin[2] intersecting the DuPage-Cook County border (Figure 3). The 100.7 square mile planning area was subdivided into 14 subwatersheds (Figure 4) which allows for a more nuanced understanding of local conditions and will improve consideration of best management practices in terms of where they will be helpful.

Figure 3. Lower Salt Creek Watershed planning area within the Des Plaines River Basin.



[2] The Des Plaines Subbasin (HUC 07120004) is a part of the Upper Mississippi region (located within the Upper Illinois subregion). Major streams include the Des Plaines River, Salt Creek, and West Branch of the DuPage River.

Figure 4. Lower Salt Creek Watershed planning area and subwatershed study units.

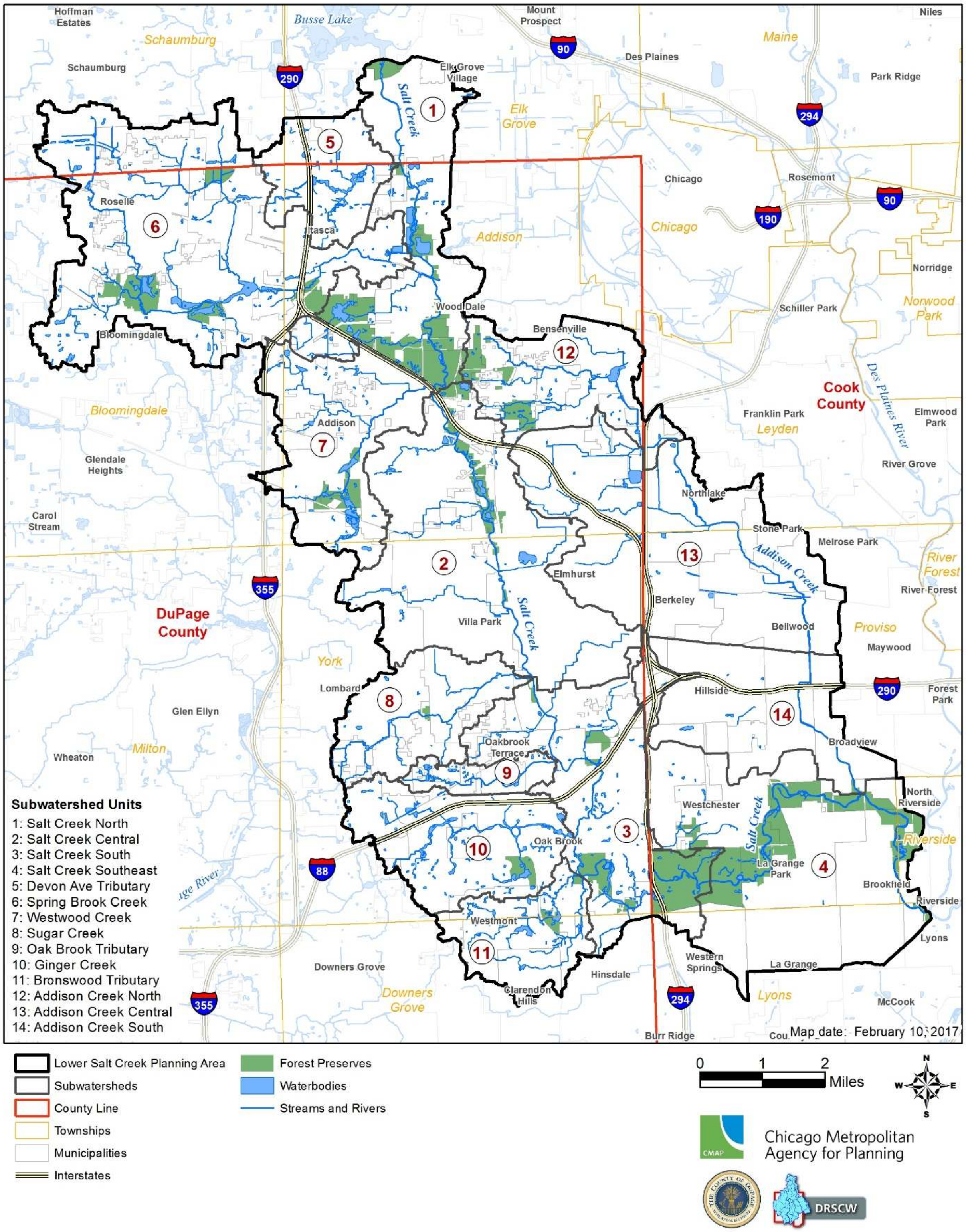


Table 1. Subwatersheds / study units in the Lower Salt Creek Planning area.

Subwatershed / Study Unit		Area	
#	Name	Square Miles	Acres
1	Salt Creek North	7.7	4,910.6
2	Salt Creek Central	12.4	7,911.0
3	Salt Creek South	7.9	5,045.9
4	Salt Creek Southeast	12.5	7,995.0
5	Devon Avenue Tributary	3.2	2,020.5
6	Spring Brook Creek	14.8	9,443.5
7	Westwood Creek	5.9	3,798.4
8	Sugar Creek	4.1	2,608.1
9	Oak Brook Tributary	1.2	762.4
10	Ginger Creek	5.4	3,433.7
11	Bronswood Tributary	3.3	2,087.6
12	Addison Creek North	4.7	3,031.2
13	Addison Creek Central	12.0	7,697.4
14	Addison Creek South	5.8	3,687.6
	Totals	**100.7**	**64,432.9**

2.1 Previous Watershed Planning and Implementation Activities

2.1.1 Water Quality-based Plans

Total Maximum Daily Loads for Salt Creek, Illinois (CH2M HILL, Inc., 2004)

This report presents the development of total maximum daily loads (TMDLs) for eight segments of Salt Creek and its tributaries Addison Creek, Spring Brook Creek, and Meacham Creek to address impairments caused by total dissolved solids/conductivity, chloride, and low dissolved oxygen. The report presents TMDLs for chlorides, carbonaceous biochemical oxygen demand (CBOD), ammonia nitrogen, and volatile suspended solids (VSS). The 2000 305(b) Report also listed copper as an impairment in Addison Creek and phosphorus as an impairment in Busse Woods Lake; however, the consultant did not develop TMDLs for these constituents due to inadequate data and recommended further monitoring in the case of copper; and cited declining phosphorus levels in Busse Lake and thereby recommended delisting. TMDLs were developed using the HSPF watershed model, BASINS, and QUAL2E water quality model, spatial data, monitoring data, and pollutant source data. Each TMDL for the Salt Creek watershed was developed to achieve full compliance with Illinois' General Use water quality standards or criteria that are correlated to the pollutant of concern. U.S. EPA approved the TMDLs in September 2004. The final TMDL report can be found at http://www.epa.state.il.us/water/tmdl/report/salt-creek/salt-creek.pdf and http://www.drscw.org/reports/SCTMDL.pdf.

DuPage River/Salt Creek Watershed TMDL Stage 1 Report (AECOM, Inc., 2009)

This report identifies 15 impaired stream segments and one impaired lake (Churchill Lagoon) for TMDL development in the DuPage River/Salt Creek watershed, based on the 303(d) list in Illinois EPA's 2008 Integrated Report. Identified impairments included total phosphorus, fecal coliform, pH, dissolved oxygen, silver, manganese, and chloride. The Stage 1 Report characterizes the watershed, verifies impairment listings in the waterbody by comparing observed data with water quality standards or appropriate targets, evaluates spatial and temporal water quality variation, provides a preliminary assessment of sources contributing to impairments, and describes potential TMDL development approaches for silver, chloride, fecal coliform, pH, dissolved oxygen, manganese, and phosphorus. (Within the Lower Salt Watershed, only the fecal coliform and pH TMDLs apply.) The Report can be found at http://www.epa.state.il.us/water/tmdl/report/dupage-salt/stage1.pdf.

Adaptive Management Plan to Improve Aquatic Life and Implement TMDLs on the Lower Salt Creek Main Stem (DRSCW, 2014)

The Adaptive Management Plan's objectives are to implement the results of the DuPage River Salt Creek Workgroup's (DRSCW) "Stream Dissolved Oxygen Improvement Feasibility Study for Salt Creek" and to implement targeted interventions to improve aquatic life. The Plan focuses on comprehensive monitoring of chemical, biological, and physical characteristics of the watershed to provide insight into the highest priority stressors affecting stream health in order to identify projects or initiatives with the greatest potential to meet stream health goals. Stressors addressed in the Plan include dissolved oxygen, chloride, polycyclic aromatic hydrocarbons, bank treatments, gravel substrate, and low fish IBI. The Plan can be found at http://www.drscw.org/reports/prioritization/LSC_SECTIONI.06262014.pdf.

DuPage River/Salt Creek Watershed TMDL Report – Revised Stage 1 Report (Tetra Tech, 2015)

This is a revised version of the DuPage River/Salt Creek Watershed TMDL Stage 1 Report developed by AECOM in 2009. In response to Illinois' Clean Water Act (CWA) Section 303(d) requirements, TMDLs need to be developed for fifteen designated waterbodies in the DuPage River and Salt Creek watershed. The preparation of this report is the first stage of the TMDL development process. The Stage 1 Report characterizes the watershed, verifies impairment listings in the waterbody by comparing observed data with water quality standards or appropriate targets, evaluates spatial and temporal water quality variation, provides a preliminary assessment of sources contributing to impairments, and describes potential TMDL development approaches for silver, chloride, fecal coliform, pH, dissolved oxygen, manganese, and phosphorus. (Within the Lower Salt Watershed, only the fecal coliform and pH TMDLs apply.) This revised report acknowledges that two waterbodies within the Lower Salt Creek watershed – RGG (Churchill Lagoon) and GLA-04 (Addison Creek) – have been removed from the TMDL project, despite that figures throughout the report still make reference to these waterbodies. (Many of these figures were previously developed by AECOM under contract with Illinois EPA.) A link to the report can be found on the DRSCW website under the

"Watershed Plans" dropdown of the "Projects" tab (http://drscw.org/wp/wp-content/uploads/2015/03/Updated-STAGE-1_DRAFT_DuPageSaltTMDL_-11-16-2015.pdf).

DuPage River/Salt Creek Watershed TMDL – DRAFT Stage 3 Report (DRSCW, 2016)

This is the Stage 3 report of the initial DuPage River/Salt Creek Watershed TMDL Stage 1 report developed by AECOM in 2009. The report gives an overview of the technical approaches used to calculate the TMDLs for fecal coliform, chloride, and dissolved oxygen; and summarizes the TMDLs for the 15 identified impaired stream segments—four of which are located within the Lower Salt Creek Watershed planning area. Additionally, the document gives a brief overview of the Stage 2 report, which summarizes DRSCW's sediment and oxygen demand data collection efforts in the watershed, and provides updates on changes that have taken place since the Stage 1 reporting. There are two updates that are applicable to the Lower Salt Creek watershed: 1) Two impaired waters—a segment of Addison Creek (GLA-04) and Churchill Lagoon (RGG)—were removed from this TMDL/LRS project; and 2) there are a handful of impairments that were determined to not exceed water quality standards for stream segments within the planning area.[3] Once the report is finalized, it can be found at http://www.epa.illinois.gov/topics/water-quality/watershed-management/tmdls/reports/index#dupsalt.

2.1.2 Flood Mitigation-based Plans

Watershed Plan for Addison Creek Tributaries (CBBEL, 2002)

This plan presents the results of a hydrologic and hydraulic analysis for the Addison Creek Watershed in the Village of Bensenville and unincorporated DuPage County. The analysis consisted of data review, field reconnaissance, a hydraulic structure and cross-section field survey, a detailed residential and commercial structure low-entry elevation survey, enhancing hydrologic and hydraulic computer analyses, an existing conditions and with-project conditions economic model, flood reduction alternative analyses, and an opinion of probable costs. The purpose of the plan was to determine inundation areas in unmapped reaches, establish the flood elevation of structures adjacent to Addison Creek tributaries, and recommend flood reduction projects to remove structures from inundation for the 100-year design storm event.

A link to the plan can be found on DuPage County Stormwater Management's "Watershed Plans" webpage (http://www.dupageco.org/EDP/Stormwater_Management/51479/) under the "Addison Creek Tributaries Watershed" subheading.

Upper Des Plaines River Tributaries Watershed Plan for Willow-Higgins Creek, Bensenville Ditch, Crystal Creek, and Addison Creek Tributaries (CBBEL, 2004)

This plan provides a stormwater and floodplain management framework for changing conditions within several subwatershed drainageways in the Upper Des Plaines River Watershed in DuPage and Cook Counties. The watershed planning information presented in

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[3] 2) Nickel in Salt Creek (GL-10) and Addison Creek (GLA-02); and pH in Salt Creek (GL-10).

the report includes watershed characteristics (hydrology and hydraulics), existing flooding and drainage patterns, proposed creek relocations, discussions of wetland and wetland buffer impacts and mitigation, and riparian impacts and mitigation. Flooding mitigation strategies include increased detention storage and increased culvert sizes. The Plan also outlines measures to mitigate impact on wetlands and riparian areas. Furthermore, the Plan addresses the benefit to water quality as a result of the O'Hare Modernization Program and mitigation measures.

A link to the plan can be found on DuPage County Stormwater Management's "Watershed Plans" webpage (http://www.dupageco.org/EDP/Stormwater_Management/51479/) under the "Des Plaines River Watershed" subheading.

Spring Brook Tributary to Salt Creek Watershed Plan (2006)

The main goals of this plan (2006 Plan) are to address flood damages to building structures and associated flood damages, and reduce maintenance costs for flood control facilities. Associated flood damages include damages to lawns, landscaping and gardens, traffic disruption of residential streets, and incidental expenses caused by flooding. The 2006 Plan includes four structural components to address flooding along Spring Brook Creek: modification of the labyrinth weir at the Meacham Grove Reservoir (completed in August 2011), replacement of the Foster Avenue culvert (completed in December 2012), replacement of the culverts at the private drive upstream of Foster Avenue (scheduled to be completed in 2016), and construction of a drainage swale to facilitate drainage of Foster Avenue. Currently, there are no plans to construct the drainage swale since the project requires property acquisition.

Addendum to the Spring Brook Tributary to Salt Creek Watershed Plan (Hey and Associates, Inc., 2011)

Following the adoption of the 2006 Plan (see above), DuPage County experienced some significant and intense storm events which caused flooding throughout the Spring Brook Watershed. As a result, the County revisited recommendations in the 2006 Plan and investigated some additional flood control alternatives. The Addendum focuses on three main objectives:

1. Optimize the Meacham Grove Reservoir to capture the most floodwater volume for the widest variety of storm events to reduce upstream and downstream residential and commercial property damages.
2. Reduce overtopping of a detention pond causing flood damages to a structure adjacent to the Springbrook Shopping Center and overtopping of Lake Street that potentially contributes to traffic damages.
3. Evaluate potential projects or alternatives that might reduce overbank flooding within the Village of Itasca in the downtown area and at the Itasca Country Club golf course.

Water quality issues and potential improvements are also noted, as well as a number of streambank stabilization projects. A link to the plan can be found on DuPage County Stormwater Management's "Watershed Plans" webpage (http://www.dupageco.org/EDP/Stormwater_Management/51479/) under the "Salt Creek Watershed" subheading.

Detailed Watershed Plan for the Lower Des Plaines River Watershed: Volume 1 (CBBEL, 2011)

The Detailed Watershed Plan (DWP) seeks to address regional problem areas along open waterways in the Lower Des Plaines River Watershed within Cook County. The primary goals of the DWP are to:

- Document stormwater problem areas,
- Evaluate existing watershed conditions using hydrologic and hydraulic models,
- Produce flow, stage, frequency, and duration information about flood events along regional waterways,
- Estimate damages associated with regional stormwater problems, and
- Evaluate potential solutions to regional stormwater problems.

Recommended strategies to mitigate flooding include streambank stabilization, flood control storage, mitigation storage, conveyance, floodwall, road raise, and levee enhancement. Cost-benefit ratios were developed for each recommendation, in addition to noneconomic criteria such as water quality impact, number of structures protected, and impact on wetland and riparian areas. The DWP can be found at: https://www.mwrd.org/pv_obj_cache/pv_obj_id_63C0EEB5F14DE064F3519B0C68C30C9F3BCD8600/filename/Final_LDPRDWP.pdf.

2.1.2 Water Quality-based Implementation Projects

Numerous projects aimed at protecting or improving water quality have been implemented throughout the Lower Salt Creek planning area (Table 2, Table 3, Figure 5). Several have been supported by federal or state grant programs including the federal Nonpoint Source Pollution Control "Section 319" Program administered through Illinois EPA, the Illinois Clean Lakes Program, the Illinois Green Infrastructure Grant (IGIG) program, and the state's Streambank Stabilization and Restoration Program (SSRP) administered by the Illinois Department of Agriculture through county Soil and Water Conservation Districts. Numerous other BMP projects have been supported by local grant funds such as DuPage County's Water Quality Improvement Program.

Table 2. Water quality-based implementation projects by subwatershed.[4]

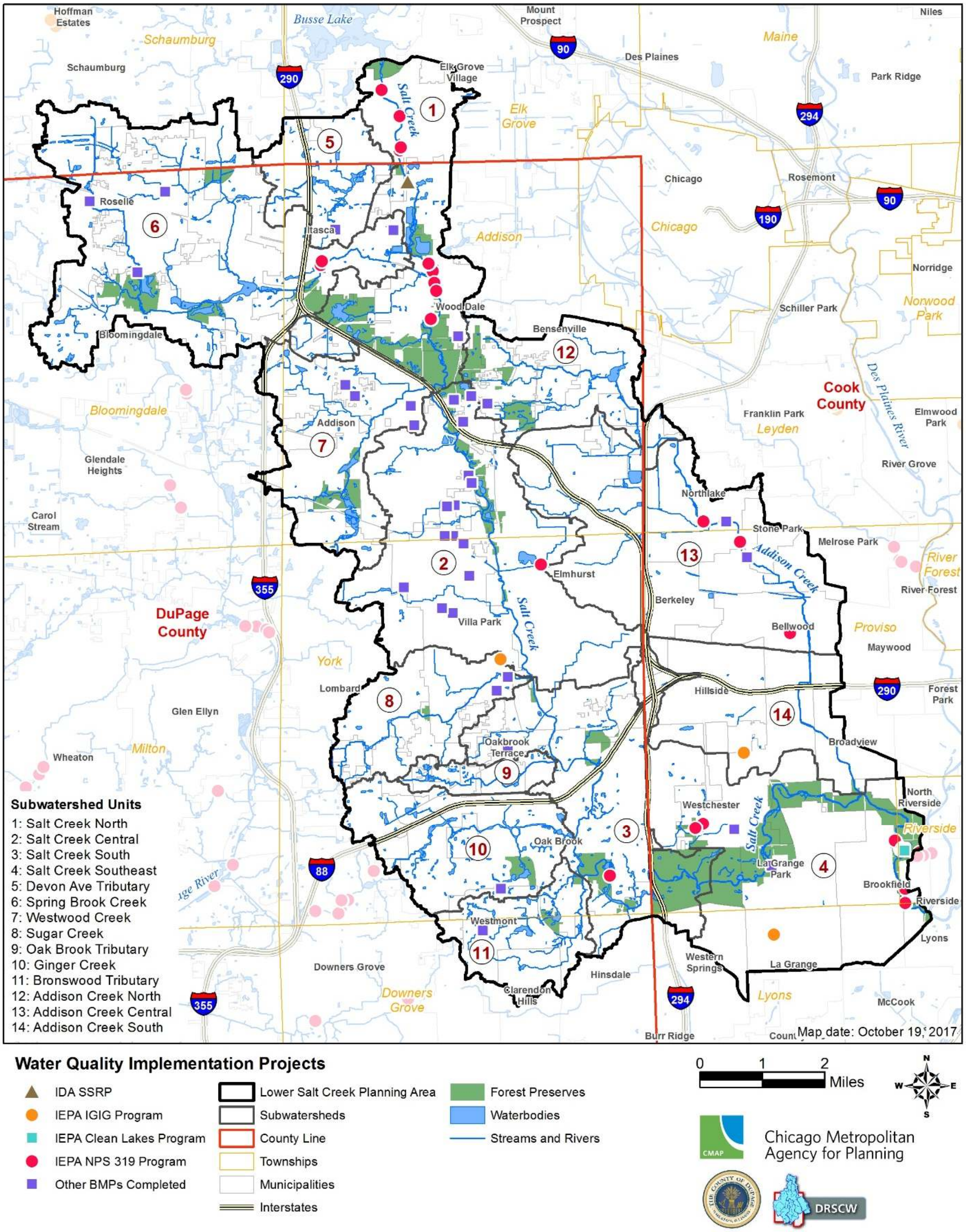
Subwatershed / Study Unit		Funding Program				
#	*Name*	*319*	*Clean Lakes*	*IGIG*	*SSRP*	*Other BMPs*
1	Salt Creek North	9	0	0	1	2
2	Salt Creek Central	4	0	0	0	17
3	Salt Creek South	1	0	0	0	2
4	Salt Creek Southeast	10	3	1	0	3
5	Devon Avenue Tributary	0	0	0	0	1
6	Spring Brook Creek	4	0	0	0	4
7	Westwood Creek	0	0	0	0	4
8	Sugar Creek	0	0	1	0	2
9	Oak Brook Tributary	0	0	0	0	0
10	Ginger Creek	0	0	0	0	1
11	Bronswood Tributary	0	0	0	0	1
12	Addison Creek North	0	0	0	0	1
13	Addison Creek Central	5	0	0	0	2
14	Addison Creek South	0	0	2	0	0
	Totals	***33***	***3***	***4***	***1***	***40***

Table 3. Water quality-based implementation projects by municipality.

Municipality	# of Completed Projects	Municipality	# of Completed Projects
Addison	8	Oak Brook	2
Bellwood	1	Oakbrook Terrace	1
Brookfield	10	Roselle	3
Elk Grove Village	4	Villa Park	15
Elmhurst	2	Westchester	6
Itasca	8	Westmont	2
La Grange	1	Wood Dale	6
La Grange Park	1	Unincorporated Areas	5
Northlake	6		
		Total	**81**

[4] Counts for the 319, Clean Lakes, IGIG, and SSRP supported projects were derived from http://www.rmms.illinois.edu/RMMS-JSAPI/ (accessed [insert date]). The "Other BMPs" were submitted to CMAP by watershed stakeholders through a web-based survey tool.

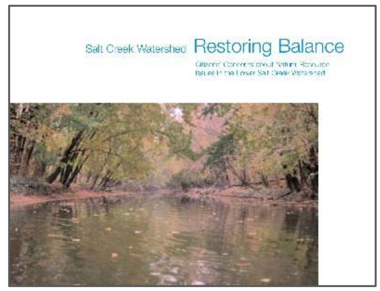
Figure 5. Water quality-based implementation projects within the Lower Salt Creek planning area.



2.1.3 Outreach and Education Publications

<u>Restoring Balance: Citizen's Concerns about Natural Resource Issues in the Lower Salt Creek Watershed (SCWN, 2002)</u>

This booklet represents the efforts of the Salt Creek Watershed Network (SCWN) to identify problem areas and share a vision of Salt Creek's future. The group envisions people making better decisions about how they manage the land, how they manage the water that flows off the land, and what they can do to participate in the enhancement, protection, and preservation of the creek. The report identifies eight issues and related actions to restore balance in the watershed. The eight issues are:



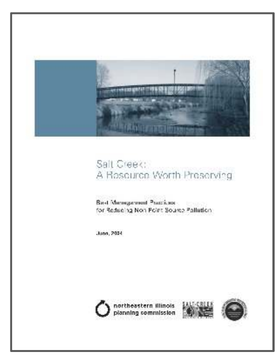
1. Water quality
2. Streambank maintenance
3. Habitat
4. Flooding
5. Land use
6. Public policy
7. Public awareness/education
8. Recreation

Recommended actions vary by issue, but many actions are common across issues, including education, developing partnerships, and ordinance enforcement. The report can be found at http://www.saltcreekwatershed.org/newsletters-and-publications/.

<u>Salt Creek: A Resource Worth Preserving – Best Management Practices for Reducing Non-Point Source Pollution (NIPC, SCWN, and IEPA, 2004)</u>

Developed by the Northeastern Illinois Planning Commission and Salt Creek Watershed Network with funding support from the Illinois EPA, this manual provides local governments and other landowners with cost-effective techniques to help improve the quality of Salt Creek. The manual covers the following best management practices (BMPs) and outlines ideas for implementation:

- Public green space management
- Natural landscaping, buffers, swales and filter strips
- Rain barrels, cisterns, and rain gardens
- Reduced road salt impacts
- Bioengineered streambank stabilization
- Naturalized detention basins
- Infiltration practices
- Green roofs



The manual can be accessed at http://www.saltcreekwatershed.org/newsletters-and-publications/.

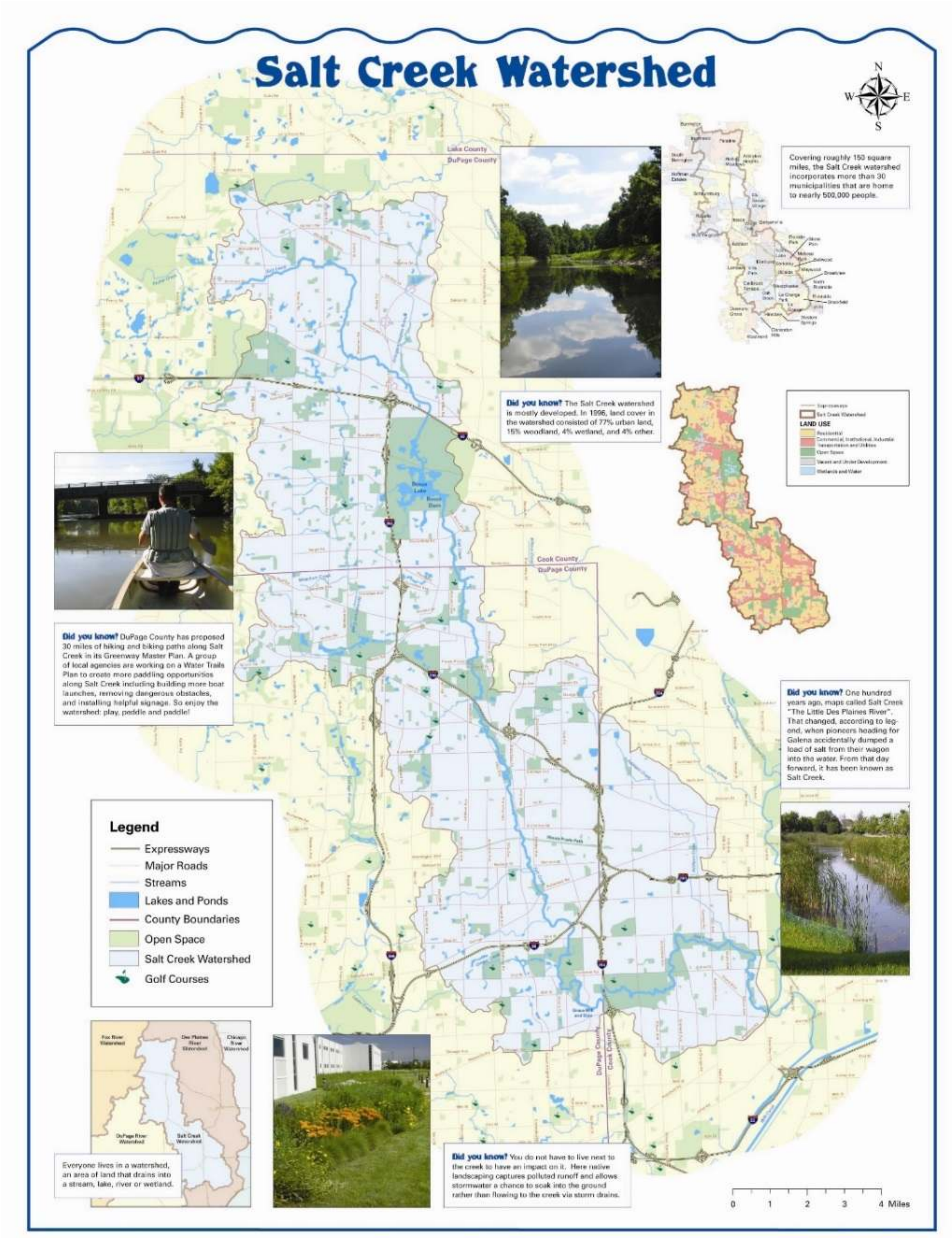
Salt Creek: A Resource Worth Preserving – Guide for Funding Watershed Improvements and Projects (NIPC, SCWN, and IEPA, 2004)

In association with the BMP manual noted above, a companion booklet was produced to provide information on funding for water quality and watershed improvement projects. The guide is divided into three categories: Water Quality; Habitat and Wetlands; and Land Conservation, Recreation, and General Environment. The guide lists organizations to contact for funding as applicable to each of the three categories. However, the grant program and contact information is now outdated.

Salt Creek: A Resource Worth Preserving – Watershed Brochure and Map (NIPC, SCWN, and IEPA, 2004)

The third piece of SCWN's education and outreach strategy was a full-color informational brochure. On one side, it described the Salt Creek Watershed Network (SCWN), the geography and history of the watershed, present challenges, and what citizens could do to help protect Salt Creek. On the other side (Figure 6), it included a map of the entire Salt Creek Watershed showing waterbodies (streams, lakes, and ponds), open space, golf courses, roadways, and counties. Three inset maps provided locational context, land use, and municipalities within the watershed.

Figure 6. Salt Creek Watershed map from 2004 brochure.



2.2 Problem Statement and Goals

During the planning process, stakeholders developed the following problem statement and watershed goals:

Problem Statement: Surface waterbodies are impacted by a variety of nonpoint sources of pollution. Within the Lower Salt Creek Watershed Planning Area, data indicates that Salt, Addison, Spring Brook, and Meacham Creeks and Swan Lake fail to meet certain water quality standards and thus do not attain all of their designated uses due to both known and unknown causes of pollution often related to land use. Best management practices, programs, and policies must be identified and implemented by landowners and managers as resources allow to improve water quality and to restore designated use attainment. A plan will be completed that outlines protective actions to address nonpoint source pollution and guide remedial activities during the following ten years.

Goal: Improve and protect the ecological integrity of surface water resources to attain or maintain designated uses of aquatic life support, fish consumption, primary contact, and aesthetic quality.

Goal: Protect, restore, and expand natural areas and increase native aquatic and terrestrial plant and animal species diversity.

Goal: Reduce flooding and attendant streambank and shoreline erosion and infrastructure risk through initiatives to improve and protect water quality.

Goal: Continue to build, strengthen, and support local partnerships and expertise to protect streams, lakes, and wetlands via plan implementation.

Goal: Continue to raise public awareness and increase understanding of the impacts of land use and land/water management decisions on water and habitat quality, and further encourage implementation of watershed protection practices.

3. Watershed Resource Inventory

3.1 Population and Demographics

Population (2010) in the planning area is estimated to be 374,699 people, 0.64 percent less than the 2000 population of 377,114.[5] The change in population was considerably less than the 3.3 percent increase for the state of Illinois during the same interval. CMAP's GO TO 2040 comprehensive regional plan (updated version, October 2014) forecasts a population of 504,931 which is a 34.7 percent increase in growth. The difference in population over the intervening 30 years translates into a (linear) growth rate of approximately one percent per decade.[6] While this may seem nominal, it is a substantial increase in estimated population growth for an area that saw no growth in the last decade. The increase in growth also exceeds the 28.6 percent growth forecast (population in households in 2040) for the entire seven county region.[7]

Employment forecasts are similarly relevant in that growth will impact land use change, water use, water quality, and other factors. The revised GO TO 2040 forecast totals for the region estimate employment growth to be 9.94 percent for the Lower Salt Creek Watershed planning area (18.3 and 26.2 percent growth for Cook and DuPage County, respectively) and 31.2 percent for the region.[8]

Table 4 features additional demographic data that characterize the planning area as compared to the entirety of Cook County, DuPage County, and the State of Illinois.

[5] U.S. Census Bureau census block data for 2000 and 2010. "Clipping" census blocks with the planning area boundary using ESRI ArcMap v10.1 geoprocessing tools will result in an overestimate of population.

[6] CMAP population and employment forecasts are based on subzone geography or a unit of geography that is different from census blocks or tracts. A subzone is equivalent to a quarter section. All the people in a subzone will be included in the forecast for the planning area despite "clipping" subzones that are intersected by the outer planning area boundary. Thus, a limited yet unknown number of people are included in the planning area forecast that technically will reside just outside of the planning area.

[7] CMAP, 2014. GO TO 2040 Update Appendix: Socioeconomic Forecast Update Overview. Available at: http://www.cmap.illinois.gov/documents/10180/332742/Update+Socioeconomic+Forecast+FINAL.pdf/41d87400-d211-4763-b941-b487022d8032

[8] Ibid.

Table 4. Select demographic data for planning area, county, and state.

Characteristic	*Lower Salt Creek Planning Area*	*Cook County*	*DuPage County*	*Illinois*
Median age	40	35	38	37
Age 65 & over	13.9%	11.9%	11.6%	12.5%
< 5 years of age	6.1%	6.6%	6.2%	6.5%
< 18 years of age	24.2%	23.7%	24.8%	24.4%
Female population	51.3%	51.6%	51.0%	51.0%
Race/One Race/White	74.1%	55.4%	77.9%	71.5%
Housing Tenure – Owner Occupied	71.0%	58.2%	74.7%	67.5%

3.2 Local Governments and Districts

In northeastern Illinois, over 1,200 units of government collect revenues and provide services to the seven-county region's residents, businesses, and visitors. Portions of 34 municipalities and 11 townships are included in the Lower Salt Creek planning area (Figure 7, Table 5). Municipal jurisdictions cover approximately 85 percent (85.6 square miles) of the planning area. Among the townships intersecting the planning area, Addison and York Townships cover the most land area at 26.6 and 27.5 square miles, or 27.3 and 26.4 percent, respectively.

There are 13 public library buildings and 25 library districts that can play an important role in the education component of the plan. There are also 35 public or private elementary/secondary/ community college schools and districts located within or intersecting the Lower Salt Creek planning area. There are seven municipal sanitary districts, 11 wastewater treatment facilities, and two mosquito abatement districts. Lastly, there are 32 municipal park districts, the Forest Preserve Districts of DuPage County and Cook County, and Illinois DNR which also have land management jurisdiction within the watershed planning area.

Figure 7. Municipalities and townships within the Lower Salt Creek planning area.

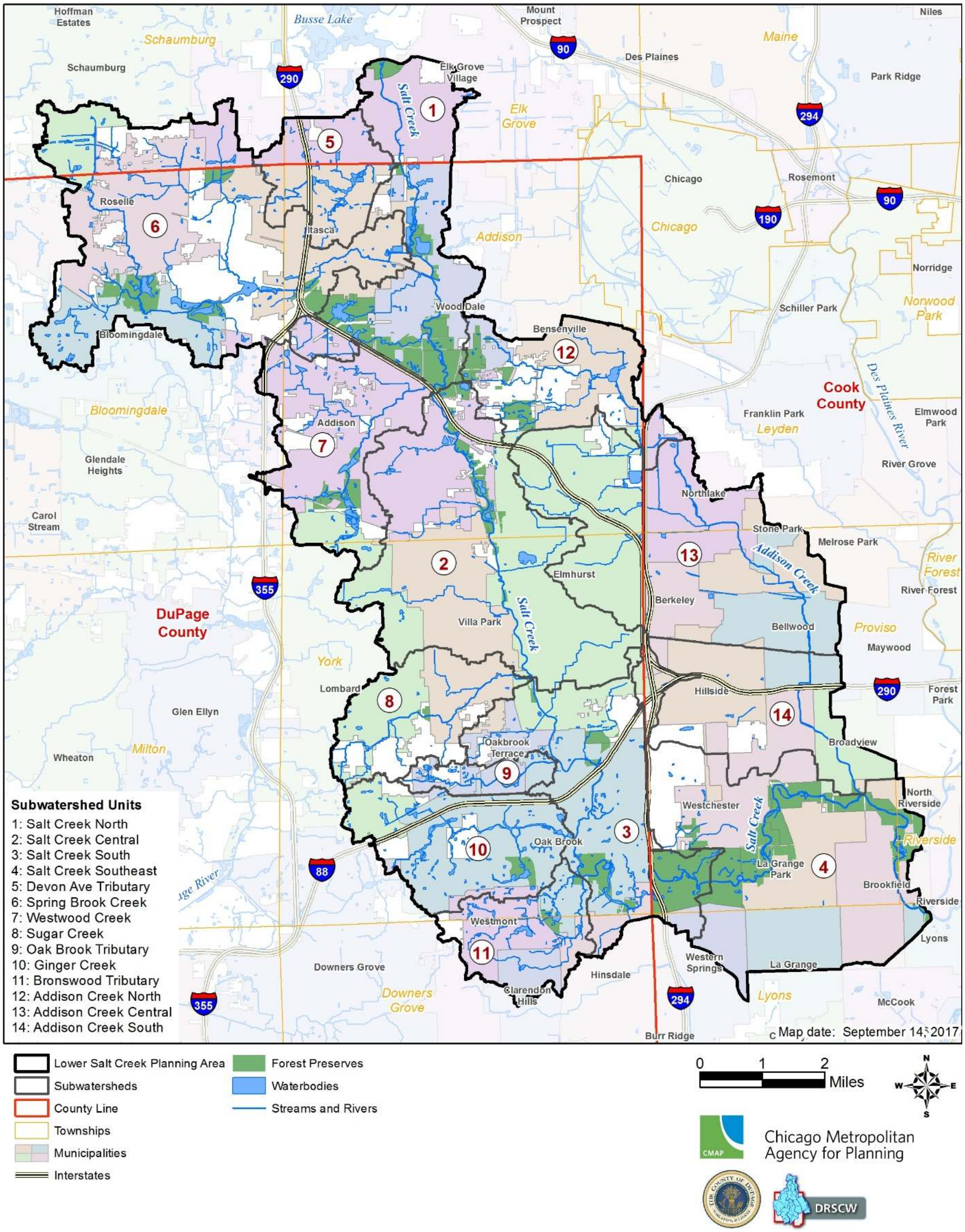


Table 5. Municipalities and townships within the Lower Salt Creek planning area.

Jurisdiction	*Area (sq. miles)*	*Area (acres)*	*Percent of Planning Area*
Municipality			
Addison	8.4	5,362.8	8.3
Bellwood	2.4	1,532.4	2.4
Bensenville	2.2	1,388.8	2.2
Berkeley	1.4	890.0	1.4
Bloomingdale	2.6	1,653.0	2.6
Broadview	1.1	707.5	1.1
Brookfield	2.6	1,660.5	2.6
Chicago*	0.0	0.7	0.0
Clarendon Hills	0.7	450.5	0.7
Downers Grove	0.1	37.0	0.1
Elk Grove Village	3.8	2,435.6	3.8
Elmhurst	10.3	6,595.5	10.2
Franklin Park*	0.0	2.3	0.0
Hillside	2.5	1,604.7	2.5
Hinsdale	0.9	570.4	0.9
Itasca	5.1	3,272.7	5.1
La Grange	1.5	967.6	1.5
La Grange Park	2.2	1,435.8	2.2
Lombard	4.2	2,712.7	4.2
Lyons	0.2	122.9	0.2
Maywood*	0.0	16.8	0.0
Melrose Park	1.5	936.3	1.5
North Riverside	0.3	164.3	0.3
Northlake	2.7	1,748.4	2.7
Oak Brook	8.3	5,306.2	8.2
Oakbrook Terrace	1.3	851.8	1.3
Roselle	3.9	2,497.0	3.9
Schaumburg	1.1	734.4	1.1
Stone Park	0.3	213.8	0.3
Villa Park	4.8	3,056.1	4.7
Westchester	3.3	2,087.8	3.2
Western Springs	1.0	628.7	1.0
Westmont	1.6	1,048.4	1.6
Wood Dale	3.3	2,103.8	3.3
Unincorporated Areas	15.1	9,636.1	15.0
Totals	**100.7**	**64,432.9**	**100.0**

Jurisdiction	*Area (sq. miles)*	*Area (acres)*	*Percent of Planning Area*
Township			
Addison	26.6	17,008.9	26.4
Bellwood	10.6	6,802.0	10.6
Chicago*	0.0	0.0	0.0
Downers Grove	2.6	1,648.6	2.6
Elk Grove	3.4	2,192.8	3.4
Leyden	2.2	1,408.3	2.2
Lyons	3.5	2,250.7	3.5
Proviso	20.8	13,293.7	20.6
Riverside	0.5	307.5	0.5
Schaumburg	3.0	1,928.6	3.0
York	27.5	17,591.8	27.3
Totals	**100.7**	**64,432.9**	**100.0**

* There are a few municipalities and townships with an insignificant portion of its boundary within the planning area, which in effect is calculated as 0.0 square miles and/or 0.0 percent of planning area. For example, 0.00000387546 square miles of Chicago falls within the planning area and appears to have an area and percent of planning area of 0.0.

3.3 Physical and Natural Features

3.3.1 Climate

The planning area has a continental climate with warm summers and cold winters. The average annual temperature is 49.9˚F. January is the coldest month with an average temperature of 23.8˚F (31.0.˚F average high/16.5˚F average low) while July is the warmest with an average of 74.0˚F (84.1˚F average high/63.9˚F average low). Annual precipitation averages 36.89 inches. Consistent with a continental climate, there is no pronounced wet or dry season.[9]

Meteorological winter features the three driest months (December 1.25 in., January 1.73 in., and February 1.79 in.) while meteorological summer features the wettest months (June 3.45 in., July 3.70 in., and August 4.90 in.) Spring and fall are similar for their average seasonal precipitation totals, 9.56 and 9.51 in. respectively.[10]

The climate is notable for two reasons: 1) the threat of rainstorms and resultant nonpoint source pollution is a year-round phenomenon, and 2) the lengthy winter season in combination with an extensive road and parking lot network results in large amounts of applied road salts whose fate has a negative impact on both local surface waters[11] and shallow groundwater[12].

3.3.2 Topography

Elevation within the planning area ranges from a high of 827 feet above mean sea level (MSL) to a low of 490 feet MSL, for total relief of 337 feet. The highest elevations are generally in the northwest and southwest with lowest elevations to the southeast and at the Elmhurst Quarry Reservoir (Figure 8).

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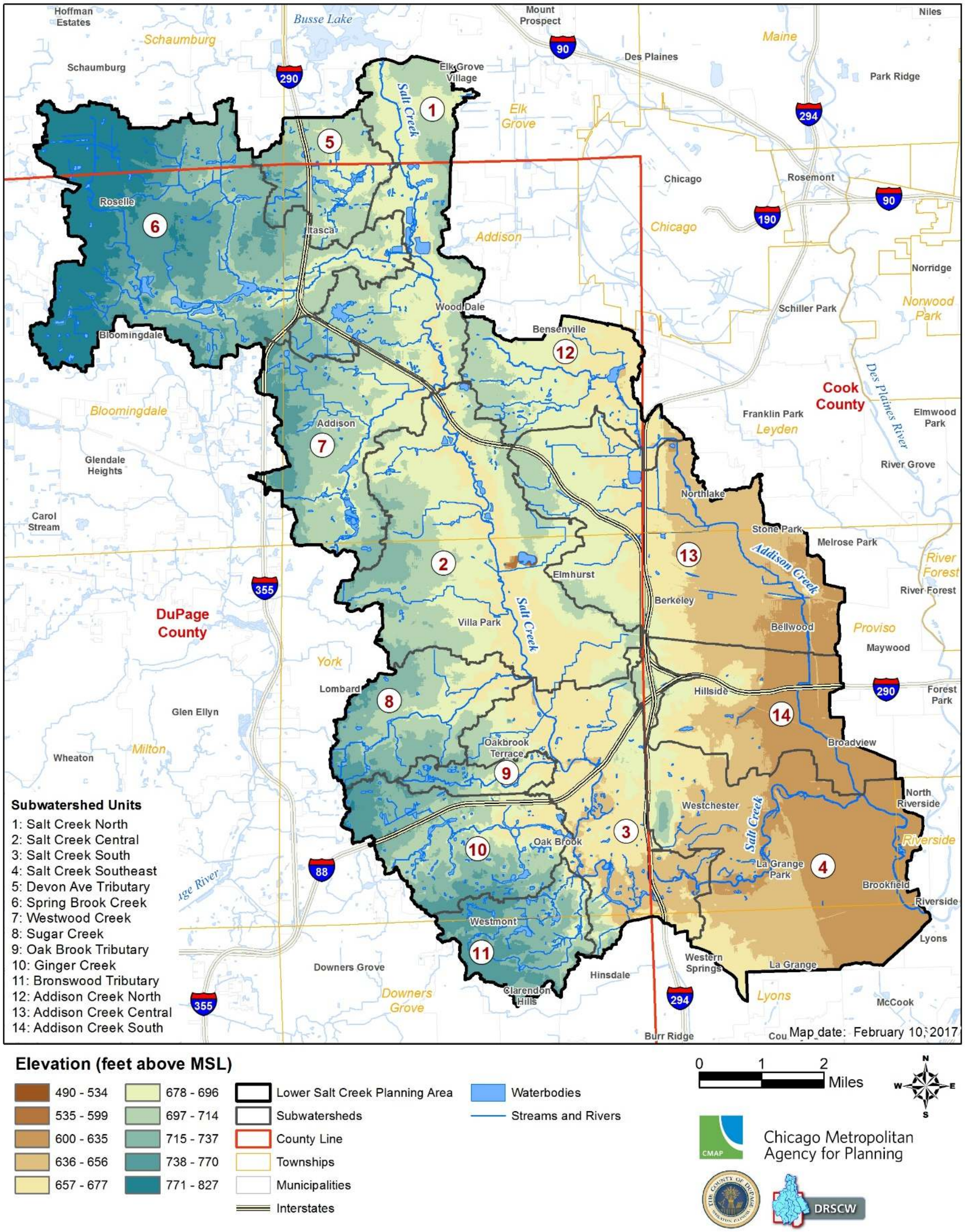
[9] U.S. Dept. of Commerce, National Oceanic & Atmospheric Administration, National Climatic Data Center. 1981-2010 Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days. Station: Chicago O'Hare International Airport, IL US. Requested and received on 02/09/2017.

[10] U.S. Dept. of Commerce, National Oceanic & Atmospheric Administration, National Climatic Data Center. 1981-2010 Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days. Station: Chicago O'Hare International Airport, IL US. Requested and received on 02/09/2017.

[11] Illinois EPA, Bureau of Water. 2012. Illinois Integrated Water Quality Report and Section 303(d) List, 2012.http://www.epa.state.il.us/water/tmdl/303-appendix/2012/iwq-report-surface-water.pdf (accessed February 2, 2015).

[12] Walton R. Kelly and Steven D. Wilson, 2008. An Evaluation of Temporal Changes in Shallow Groundwater Quality in Northeastern Illinois Using Historical Data. Illinois State Water Survey, Center for Groundwater Science. Scientific Report 2008-01. Champaign, Illinois.

Figure 8. Elevation in the Lower Salt Creek planning area.



3.3.3 Ecoregion Geography

Ecoregions have been composed as a robust geographic framework based on the principle that they can be identified and mapped by analyzing the spatial patterns and composition of observable biotic and abiotic factors that either affect or reflect differences in ecosystem quality and integrity.[13] Put another way, ecoregions organize space around ecosystems that are similar and take into consideration such phenomena as geology, physiography, climate, soils, hydrology, wildlife, vegetation, soils, and land use. Ecoregion maps are useful in the development of ecosystem management strategies, especially since land use – human alteration and occupation of the land – informs ecoregion delineation at levels III and IV which are smaller (i.e., spatial extent) subdivisions of levels II and III, respectively.

The planning area lies entirely within the Central Corn Belt Plaines (Level III), and is characterized by the Valparaiso-Wheaton Morainal Complex as well as the Chicago Lake Plain ecoregions (Level IV) at 91.1 and 9.6 square miles, respectively.[14] While perhaps not as relevant here as within areas of greater spatial extent that also feature large federal or state land holdings, the information can be instructive nonetheless to more local land conservation efforts. The Valparaiso-Wheaton Morainal Complex exhibits a landscape shaped by glaciation – rolling till plains, moraines, outwash plains and a disconnected drainage system comprised of kettle holes, ravines, small lakes, and marshes. The Chicago Lake Plain exhibits a paleo-lake plain that is nearly flat with morainal and bedrock ridges, swales sand dunes, as well as paleo-spits. Ecosystem management strategies are likely to be differ across the two ecoregions with respect to their physiography (Figure 9).[15]

3.3.4 Surficial Geology

Surficial geology is important because it can help guide land use planning and land management practices. Understanding the composition of geologic materials can shed light on areas that are sensitive to contamination and in need of protection, potential aquifer recharge areas, land that is suitable for reservoirs, as well as drainage and weight bearing properties that are useful for siting future development and infrastructure.[16] Figure 10 shows the planning area is primarily dominated by fine grain matrix of diamicton deposits as till and ice-marginal sediment—a product of surface deposits from the most recent glaciation, the Wisconsin

[13] US EPA, Western Ecology Division. Models, Statistical Program and Data Sets: Ecoregion Maps. Available at http://www.epa.gov/wed/pages/ecoregions.htm

[14] US EPA, Level III and IV Ecoregions by State, https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-state (accessed October 26, 2016).

[15] US EPA, Summary Table: Characteristics of the Ecoregions of Illinois, ftp://newftp.epa.gov/EPADataCommons/ORD/Ecoregions/il/il_back.pdf (accessed October 26, 20106)

[16] J.E. Bogner et al., "Geology for Planning in Northeastern Illinois: I. Geologic Framework, Project Goals, and Procedures," Illinois State Geological Survey, May 1976.

Episode. These have formed a combination of end and ground moraines across the Lower Salt Creek watershed. In addition to diamicton deposits, bedded silts, clays, as well as sand and gravel deposits surround Salt Creek and some of its western tributaries. These are commonly found along the floodplains and channels of modern rivers and streams throughout DuPage and Cook Counties.[17] The Lower Salt Creek Watershed also exhibits a bedrock of Silurian sedimentary rock that is covered with unconsolidated surficial deposits, averaging 20 to 100 feet thick.[18] Collectively, the composition of the watershed's surficial geology highlights that the area has relatively poor drainage and few potential areas for aquifer recharge, with the exception of the alluvial sands and gravel along Salt Creek and its tributaries. These areas surrounding streams and tributaries are likely to be more susceptible to fertilizer, herbicide, and insecticide applications, and therefore, are in greatest need of protection. Floodplain and ecosystem protection as well as sustainable land management best practices should be emphasized to ensure improved water quality in streams and Lower Salt Creek Watershed at large.

[17] Illinois State Geological Survey, "Surficial Deposits of Illinois," 2000, http://isgs.illinois.edu/sites/isgs/files/maps/statewide/ofs2000-07.pdf

[18] S.M. Taylor and R.H. Gilksen, "VII. Geology for Planning In DuPage County," Illinois State Geological Survey, February 1977.

Figure 9. Ecoregions in the Lower Salt Creek planning area.

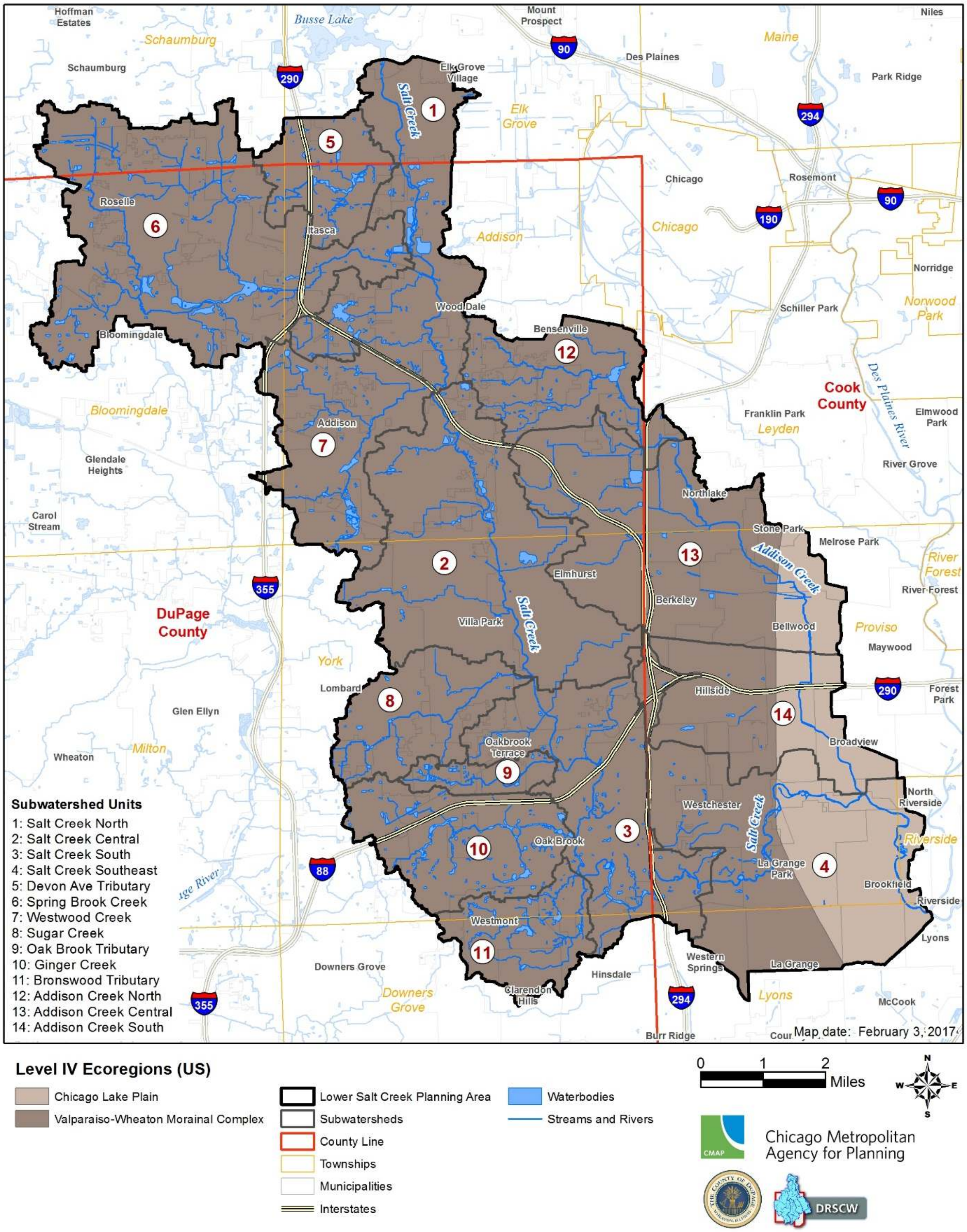
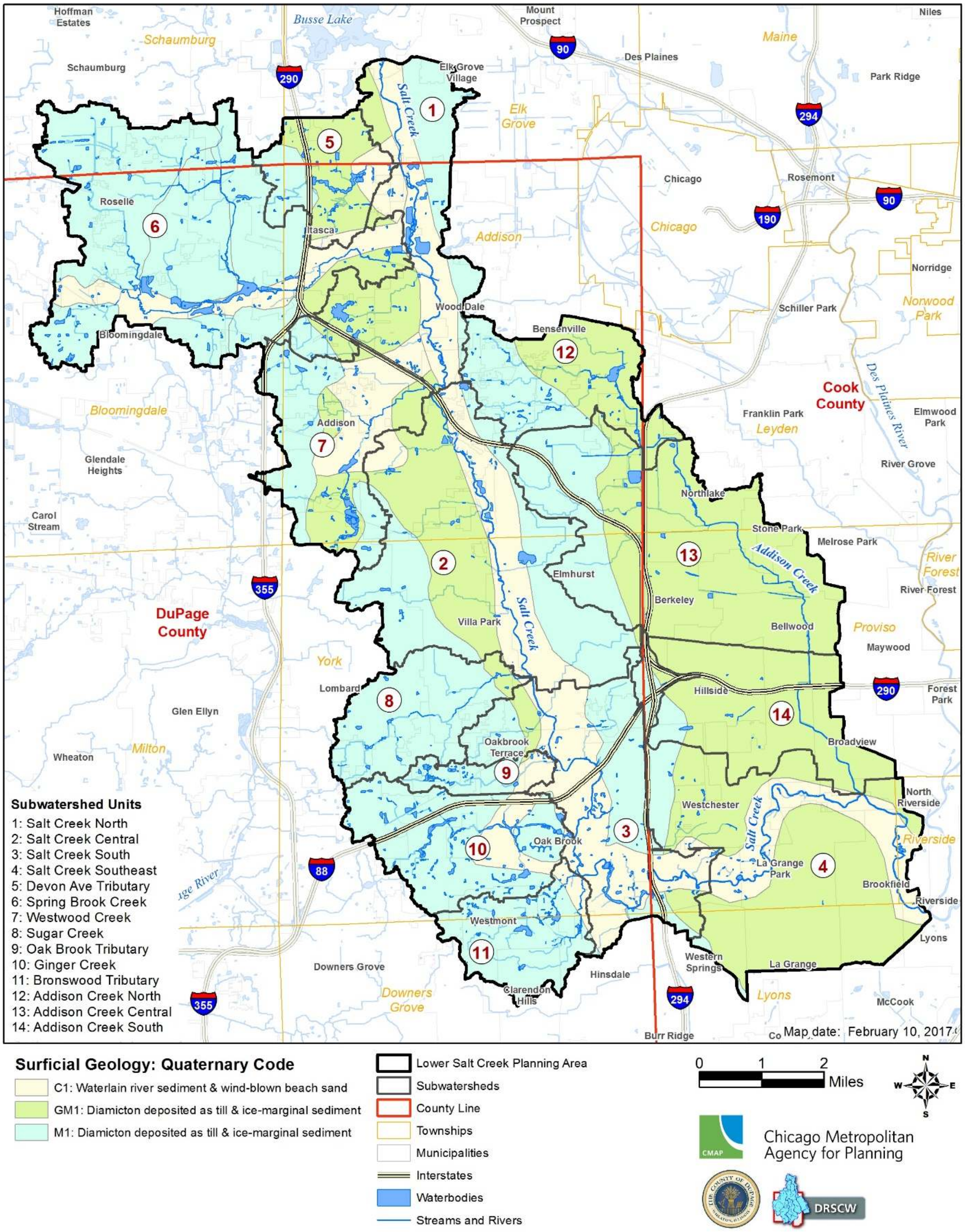


Figure 10. Surficial geology in the Lower Salt Creek planning area.



3.3.5 Soils

For purposes of this watershed plan, hydrologic soils groups, hydric soils, soil drainage class, and highly erodible soils will be discussed. It is important to consider these types of soil classifications as they relate to land use/change and water quality. The soils data are obtained from the Soil Survey Geographic (SSURGO) Database produced by the U.S. Department of Agriculture – Natural Resources Conservation Service (NRCS)[19].

3.3.5.1 Hydrologic Soil Groups

Hydrologic soil groups (HSGs) feature similar physical and runoff characteristics. Along with land use, management practices, and hydrologic conditions, HSGs determine a soil's associated runoff curve number which is used in turn to estimate direct runoff from rainfall. This information is particularly useful to planners, builders, and engineers to determine the suitability of sites for projects and their design. Projects might include, for example, stormwater management systems and septic tank/field locations or more broadly, new neighborhood design.

The four hydrologic soil groups are described as A: soils with low runoff potential when wet / water is transmitted freely through the soil, B: moderately low runoff potential when wet / water transmission through the soil is unimpeded, C: moderately high runoff potential when wet / water transmission is somewhat restricted, and D: high runoff potential when wet / water movement through the soil is restricted or very restricted. If certain wet soils are able to be drained, they are assigned to dual HSGs (e.g., A/D, B/D) based on their saturated hydraulic conductivity and the water table depth when drained. The first letter refers to the drained condition and the second to an undrained condition (Table 6).

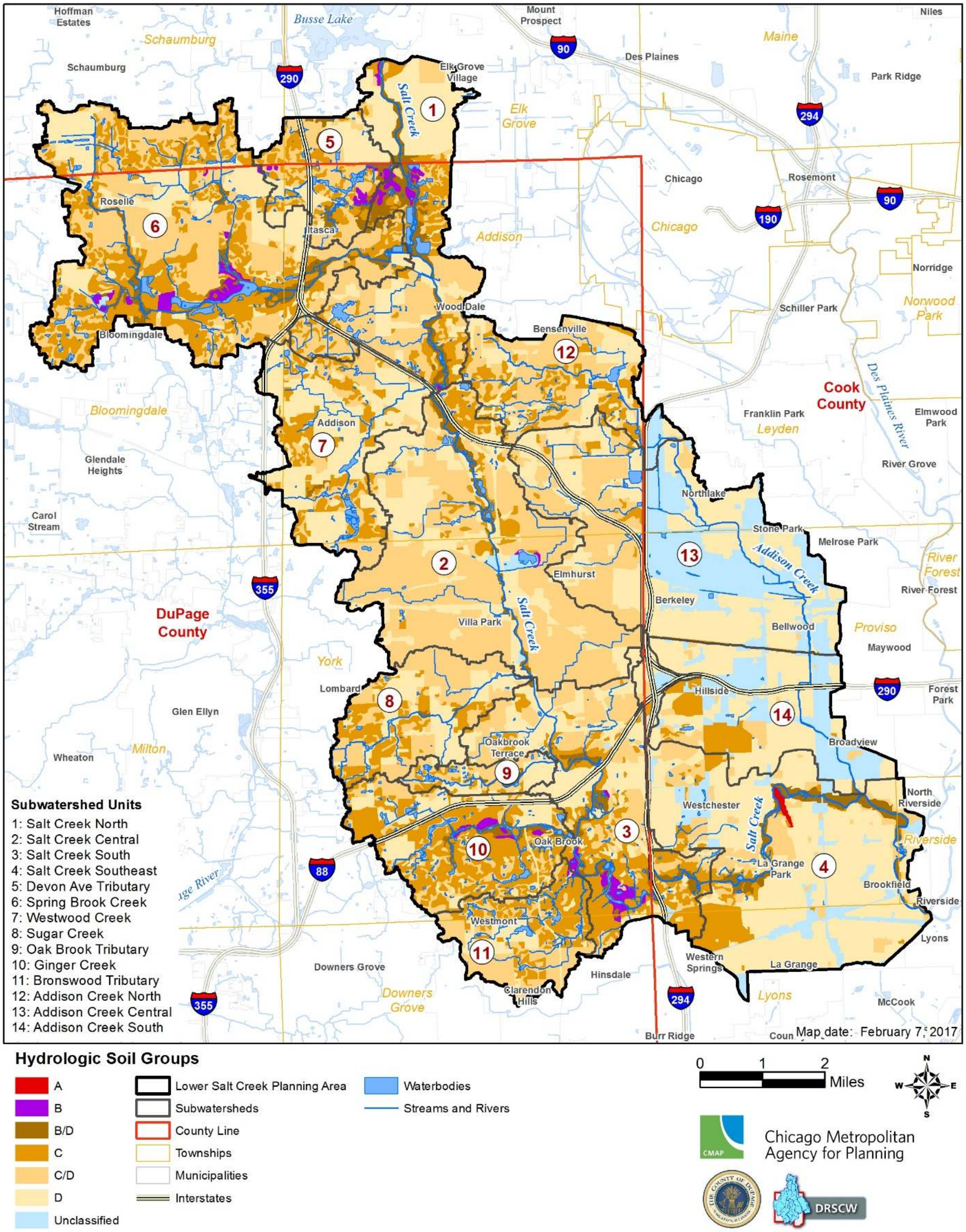
[19] http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/geo/

Table 6. Characteristics and extent of hydrologic soil groups in the Lower Salt Creek planning area.

Hydrologic Soil Group	*Definition/Characteristics*	*Area (acres)*	*Percent of Planning Area*
A	Soils have a low runoff potential when thoroughly wet. Water is transmitted freely through the soil.	38.9	0.06
A/D	The first letter applies to the drained condition and the second to the undrained condition.	0.0	0.00
B	Soils have moderately low runoff potential when thoroughly wet. Water transmission through the soil is unimpeded.	550.7	0.85
B/D	The first letter applies to the drained condition and the second to the undrained condition.	2,465.1	3.83
C	Soils in this group have moderately high runoff potential when thoroughly wet. Water transmission through the soil is somewhat restricted.	11,640.8	18.07
C/D	The first letter applies to the drained condition and the second to the undrained condition.	20,838.0	32.34
D	Soils in this group have high runoff potential when thoroughly wet. Water movement through the soil is restricted or very restricted.	23,120.9	35.88
Unclassified	n/a	5,778.7	8.97
	Totals	***64,432.9***	***100.0***

The majority of the Lower Salt Creek planning area features group C/D and group D soils, approximately 32 and 36 percent, respectively (Figure 11). The unclassified soils are those underlying waterbodies, gravel pits, and highly developed land complexes along commercial, industrial and rail corridors. There are no A/D soils present and only 38.9 acres of group A soils, located in the southeast corner of the planning area. Figure 11 illustrates a general pattern of HSG distribution, revealing that B, B/D, and C soils are found primarily along stream and river corridors where under saturated condition, infiltration is limited and runoff potential is moderately high.

Figure 11. Hydrologic soil groups in the Lower Salt Creek planning area.



3.3.5.2 Hydric Soils

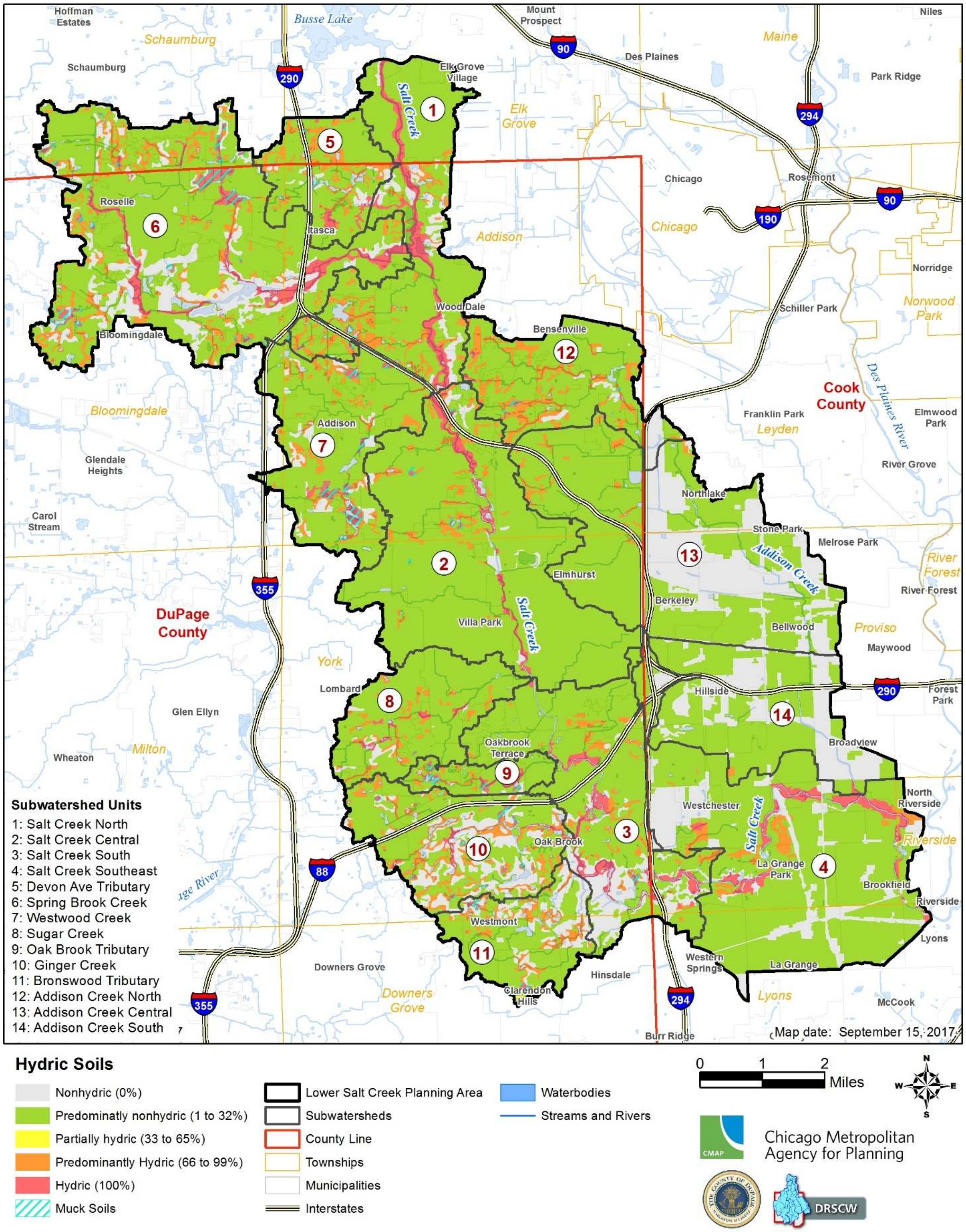
Hydric soils are those soils that developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation and are sufficiently wet in the upper part of the soil profile to develop anaerobic conditions during the growing season. The presence of hydric soils is used as one of three key criteria for identifying the historic existence of wetlands. Knowledge of hydric soils has both agricultural and nonagricultural applications including land use planning and conservation area planning. Much like an understanding of hydrologic soils groups, knowledge of the location and pattern of hydric soils can inform planners, builders, and engineers and influence their project design and location decisions.

The extent of hydric soils within the Lower Salt Creek planning area is shown in Figure 12 and enumerated in Table 7. Nearly half (73.6 percent) of the Lower Salt Creek planning area features “not hydric” soils. “All hydric” soils are distributed throughout the planning area, most commonly along stream and river corridors, and represent approximately 3.9 percent of the planning area. Muck soils are a subset of hydric soils.

Table 7. Hydric soil extent in the Lower Salt Creek planning area.

Hydric Soil Class	*Area (acres)*	*Percent of Planning Area*
Nonhydric (0%)	10,157.2	15.8%
Predominantly nonhydric (1 to 32%)	47,396.2	73.6%
Partially hydric (33 to 65%)	12.8	0.02%
Predominantly hydric (66 to 99%)	4,369.2	6.8%
Hydric (100%)	2,497.6	3.9%
Totals	***64,432.9***	***100.0***

Figure 12. Hydric soils in the Lower Salt Creek planning area.



3.3.5.3 Soil Drainage Class

Soils are categorized in drainage classes based on their natural drainage condition in reference to the frequency and duration of wet periods.[20] The classes are Excessively Drained, Somewhat Excessively Drained, Well Drained, Moderately Well Drained, Somewhat Poorly Drained, Poorly Drained, and Very Poorly Drained.[21] The extent of soils in these drainage classes within the Lower Salt Creek planning area is shown in Figure 13 and enumerated in Table 8.

Knowledge of soil drainage class is commonly used for agricultural applications; however, in more developed regions it can also be used for stormwater and water quality applications. For example, the Well Drained and Moderately Well Drained drainage classes (which cover approximately 41 percent of the planning area) can indicate where stormwater infiltration BMPs may best be utilized. On the other hand, excessively drained soils (38.9 acres of the planning area) may not be good locations for siting infiltration BMPs where shallow groundwater is present.

The Poorly Drained drainage classes indicate soils that are wet at shallow depths over periodic or significantly long periods of time. Soils in the Somewhat Poorly Drained, Poorly Drained, or Very Poorly Drained drainage class occur on approximately 46 percent of the planning area. These areas are often prone to frequent ponding and flooding and can be associated with increased stormwater runoff and nonpoint source pollution.

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[16] Soil Survey Staff, USDA-NRCS. Soil Survey Geographic (SSURGO) Database. SSURGO 2.2.6 Table Column Descriptions, dated June 26, 2012. Available online at http://soils.usda.gov/survey/geography/ssurgo/index.html (accessed March 26, 2013).

[17] Soil Conservation Service, Soil Survey Staff. *Soil Survey Manual*. USDA Handbook 18. Washington, D.C.: USDA NRCS, 1993. http://soils.usda.gov/ technical/manual/ (accessed September 14, 2011).

Figure 13. Soil drainage classes in the Lower Salt Creek planning area.

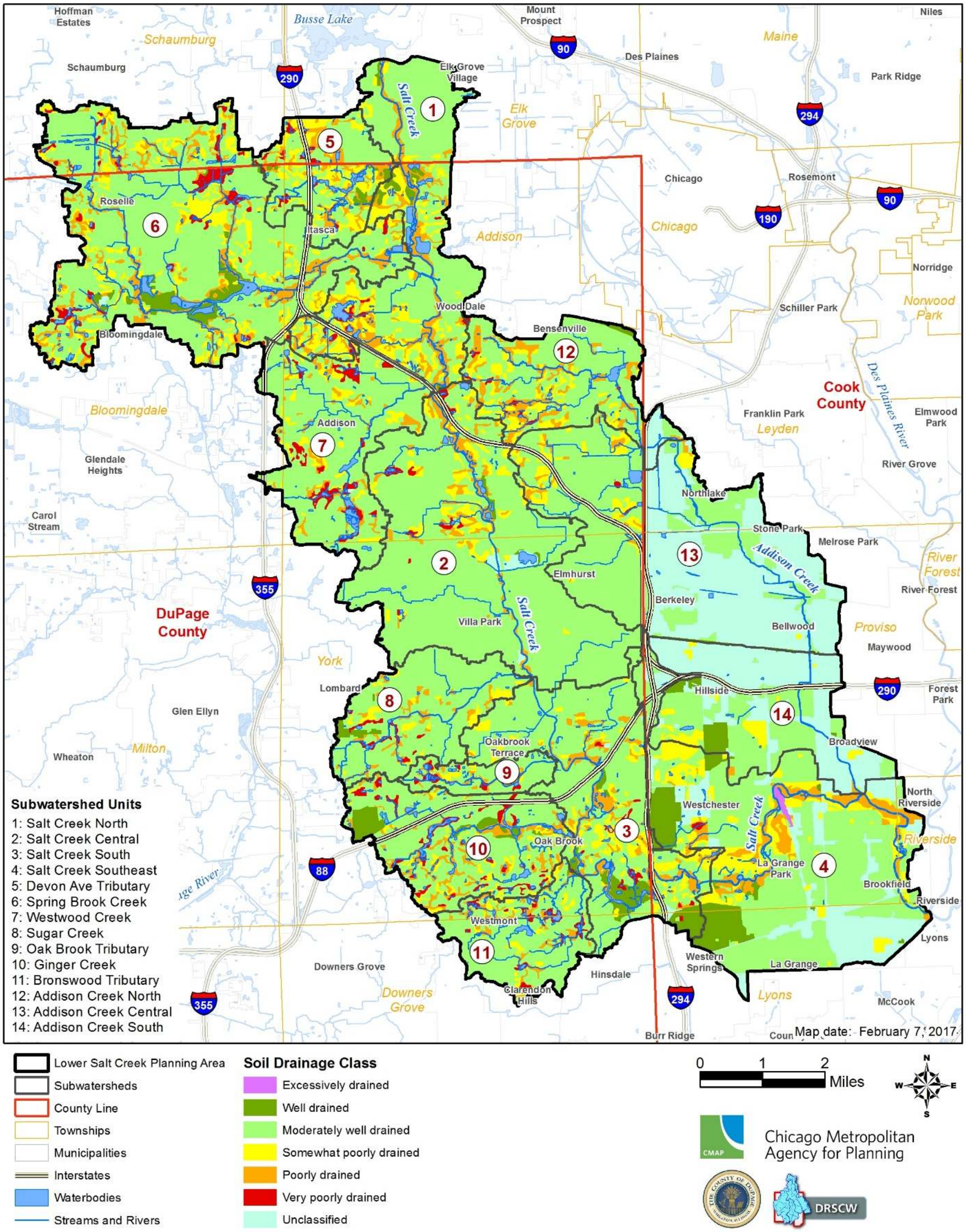


Table 8. Extent of soil drainage classes in the Lower Salt Creek planning area.

Soil Drainage Class	*Area (acres)*	*Percent of Planning Area*
Somewhat excessively drained	38.0	0.04
Well drained	2,040.9	3.10
Moderately well drained	40,895.3	37.71
Somewhat poorly drained	5,992.2	21.62
Poorly drained	5,583.5	17.11
Very poorly drained	1,296.1	7.51
Unclassified	8,586.2	12.91
Totals	***64,432.9***	***100.0***

3.3.5.4 Highly Erodible Soils

The USDA – NRCS defines a highly erodible soil or soil map unit as one that has a maximum potential for erosion that equals or exceeds eight times the tolerable soil erosion rate (T).[22] The maximum potential erosion rate is determined using the formula RKLS/T (where R = the rainfall factor, K = erodibility value of the soil, and LS = the slope factor). If RKLS/T > 8, then the soil meets the criteria for a highly erodible soil.[23] All soil map units with "C" slopes or greater are considered highly erodible in Illinois.[24] Highly erodible soils are of concern because they are primarily located along the tributaries and main stems of Salt Creek. Note that the maximum erosion potential is calculated without consideration of stream bank restoration or conservation management practices which can markedly lower the actual erosion rate.

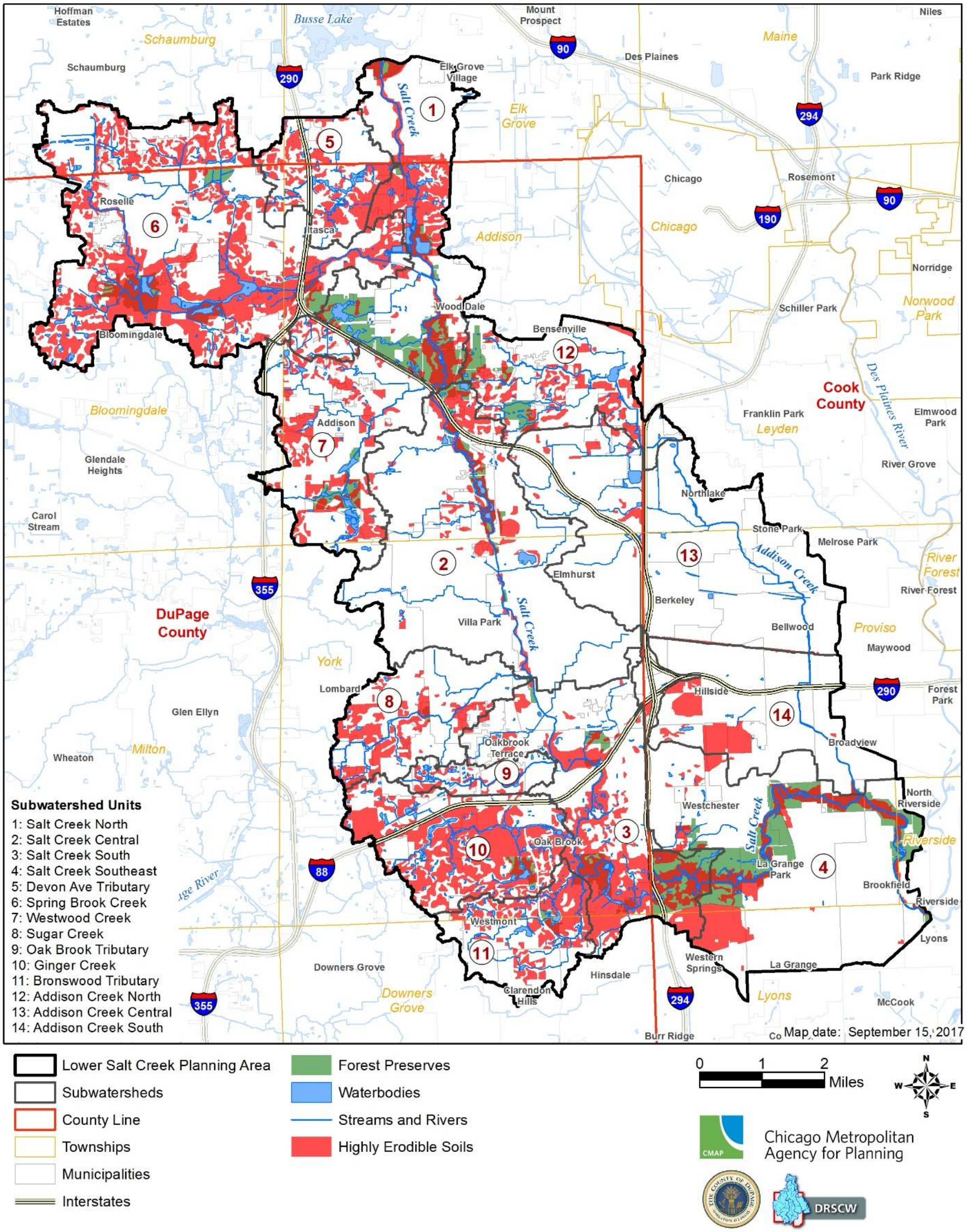
Figure 14 illustrates the pattern of highly erodible soils in the Lower Salt Creek planning area, covering 14,694.9 acres (22.8 percent). Also keep in mind that all soils can severely erode when excavated and stockpiled; thus, erosion control practices should be planned for any human disturbance of an area.

[22] The soil loss tolerance rate (T) is the maximum rate of annual soil loss that will permit crop productivity to be sustained economically and indefinitely on a given soil. Erosion is considered to be greater than T if either the water (sheet & rill) erosion or the wind erosion rate exceeds the soil loss tolerance rate. The NRCS uses the Universal Soil Loss Equation (USLE) to determine a soil's erosion rate by analyzing rainfall effects, characteristics of the soil, slope length and steepness, and cropping and management practices.

[23] http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ri/soils/?cid=nrcs144p2_016637

[24] Bob Oja, McHenry-Lake County SWCD. Nov. 24, 2014. Personal communication.

Figure 14. Highly erodible soils in the Lower Salt Creek planning area.



3.3.6 Floodplains

A floodplain is defined as "any land area susceptible to being inundated by floodwaters from any source."[25] The 100-year floodplain or "base flood" encompasses an area of land that has a 1-in-100 chance of being flooded or exceeded within any given year; the 500-year floodplain has a 1-in-500 chance of being flooded or exceeded within any given year. Floodways are defined by the National Flood Insurance Program as "the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height."[26] Floodways are a subset of the 100-year floodplain and carry the deeper, faster moving water during a flood event.

Prior to modern day floodplain and stormwater management regulations, development in the Lower Salt Creek planning area and throughout the Chicago region occurred in flood prone areas, such as floodplains, wetlands, and other low-lying areas. Before these flood prone areas were developed, they provided natural flood control in the watershed. While flooding is a natural process, the development of these lands places homes, businesses, and people in harm's way, and reduces the land's natural flood control capacity, thus pushing the water to areas that may not have flooded previously. In effect, flooding can result in property damage, streambank erosion, and degraded water quality. Thus, it is important that floodplains and their relationship to land use be considered in local plans and development codes.

Within the Lower Salt Creek Watershed planning area, approximately 9.1 percent (5,845 acres or 9.1 square miles) of the planning area falls within the 100-year floodplain; and an additional 3.2 percent (2,055.9 acres or 3.2 square miles) falls within the 500-year floodplain (Table 9, Table 10, Figure 15). These calculations are based on a compilation of floodplain data CMAP received from the Federal Emergency Management Authority (FEMA) in 2017, and from DuPage County in 2015. The Spring Brook Creek subwatershed contains the most floodplains with 1,180.6 acres (2.7 square miles) followed by the Salt Creek Southeast and Salt Creek North subwatersheds with 884 acres (1.4 square miles) and 851.2 acres (1.3 square miles), respectively.

Table 9. Floodplains in the Lower Salt Creek planning area.

Floodplain	*Area (acres)*	*Percent of Planning Area*
100-year	5,845.0	9.1
500-year	2,055.9	3.2
Totals	**7,900.9**	**12.3**

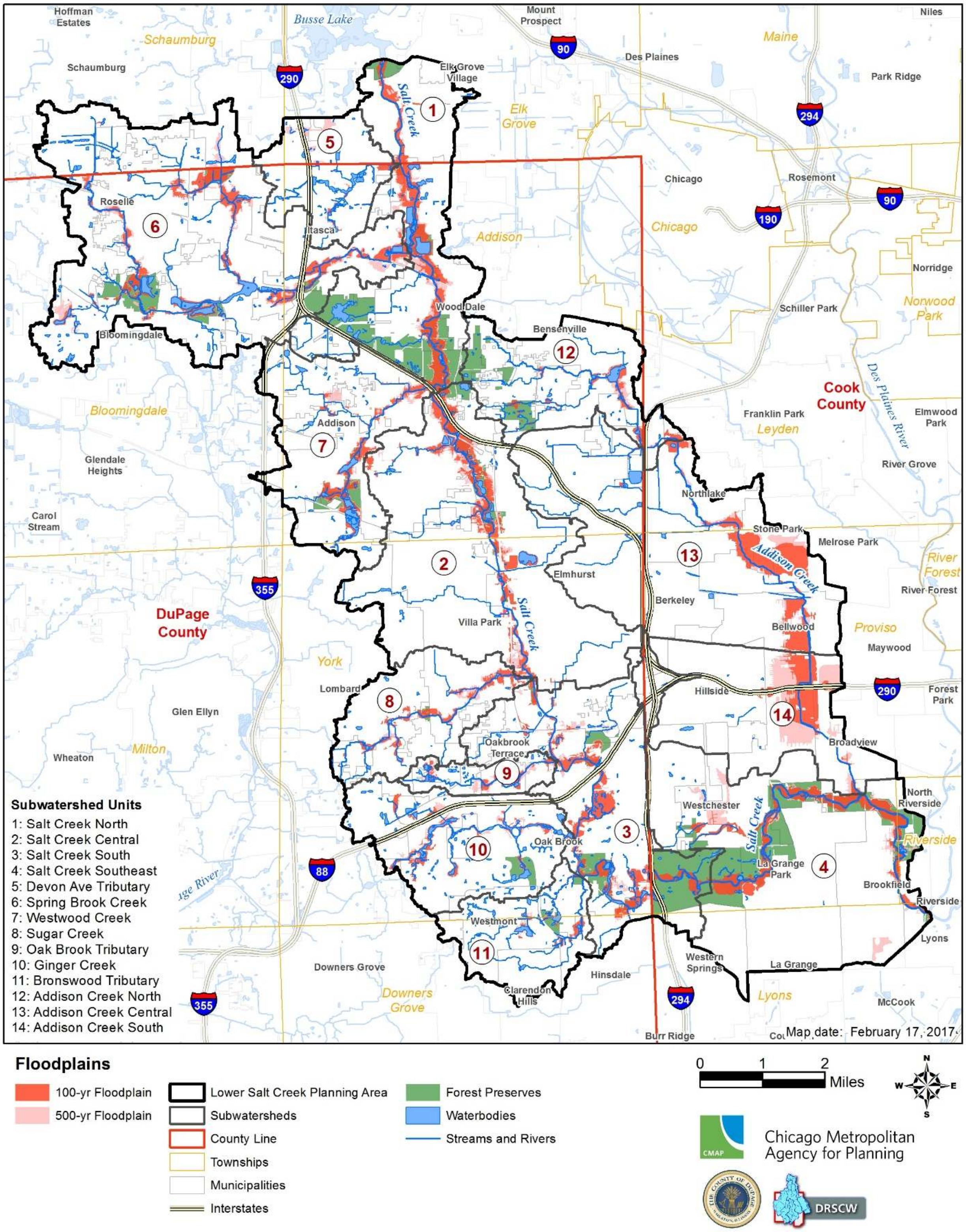
[25] Federal Emergency Management Agency (FEMA), Floodplain Management Requirements, Appendix D: Glossary, August 11, 2010, accessed October 27, 2014, http://www.fema.gov/pdf/floodplain/nfip_sg_appendix_d.pdf

[26] Federal Emergency Management Agency (FEMA), Floodplain Management Requirements, Appendix D: Glossary, August 11, 2010, accessed December 22, 2014, https://www.fema.gov/floodplain-management/floodway

Table 10. Acreage of floodplains in Lower Salt Creek subwatersheds.

Subwatershed / Study Unit		100-yr and 500-yr Floodplain Area		
#	***Name***	*100-yr Floodplain (acres)*	*500-yr Floodplain (acres)*	*Total (acres)*
1	Salt Creek North	688.4	162.8	851.2
2	Salt Creek Central	645.1	203.9	849.0
3	Salt Creek South	673.4	150.8	824.2
4	Salt Creek Southeast	668.8	215.7	884.4
5	Devon Avenue Tributary	71.0	71.8	142.8
6	Spring Brook Creek	837.3	343.3	1,180.6
7	Westwood Creek	318.2	107.3	425.4
8	Sugar Creek	203.2	79.8	283.0
9	Oak Brook Tributary	81.9	59.0	140.9
10	Ginger Creek	289.7	105.4	395.1
11	Bronswood Tributary	106.4	22.4	128.8
12	Addison Creek North	196.4	36.9	233.2
13	Addison Creek Central	664.8	143.0	807.8
14	Addison Creek South	400.5	353.9	754.4
	Totals	**5,845.0**	**2,055.9**	**7,900.9**

Figure 15. Floodplains in the Lower Salt Creek planning area.



3.3.7 Wetlands

Wetlands provide social, economic, and ecological benefits to communities by cleaning polluted runoff before discharging to other surface waterbodies, recharging aquifers that are used as drinking water supplies, and providing temporary storage for rainfall to reduce flooding. At the regional landscape scale, wetlands are an integral part of the movement to conserve green infrastructure and thereby employ nature to help manage hydrology in the built environment. There are many other wetland functions that generate ecosystem services that are valued by society. Despite these benefits, the extent of America's wetlands continues to decline.[27]

Based on the National Wetlands Inventory, there are an estimated 1,927.7 acres of wetlands (approximately 3 percent of the land area) within the Lower Salt Creek Watershed planning area (Figure 16). Five classifications of wetlands are present – freshwater emergent wetland, freshwater forested/shrub wetland, freshwater pond, lake, and riverine (Table 11, Table 12). Freshwater ponds account for 675.9 acres (1 percent) of the wetland coverage in the Lower Salt Creek planning area followed by freshwater emergent wetlands with 555.7 acres (approximately 0.9 percent of the planning area). Of the subwatershed units, Salt Creek North encompasses the most wetland acres (299.3 acres) relative the unit total acreage, followed by Westwood Creek and Ginger Creek with 198.6 acres and 173.3 acres, respectively. Addison Creek South and Addison Creek Central has the least wetland acreage (17.6 acres and 81.2 acres, respectively) coverage relative to the study unit acreages. Subwatershed study units with the least amount of wetland acreage present opportunities for wetland restoration and enhancement of public and private lands.

Table 11. Wetlands in the Lower Salt Creek planning area.

Wetland Type	*Area (acres)*	*Percent of Planning Area*
Freshwater Emergent Wetland	555.7	0.9
Freshwater Forested/Shrub Wetland	270.9	0.4
Freshwater Pond	675.9	1.0
Lake	179.9	0.3
Riverine	245.3	0.4
Totals	**1,927.7**	**3.0**

Over half of the wetlands present in the watershed intersect one space. However, only 446 acres are completely surrounded – 225 acres are within the forest preserves and the remaining 171 acres are located within parks or golf courses. Wetlands that are not in the forest preserves, or protected open space—present opportunities for additional protection status, such as conservation easements or

[27] U.S. Fish and Wildlife Service, 2011. National Wetlands Inventory. http://www.fws.gov/wetlands/Status-And-Trends-2009/index.html.

acquisition. Wetlands that are within golf courses also presents opportunities for applying sustainable turf management practices to improve the overall health of the watershed.

Freshwater emergent wetlands commonly border freshwater ponds and lakes. These wetlands exhibit tall herbaceous and hydrophyte plants that are rooted under and extend out of the water. Names such as marshes, wet meadows, fens, and sloughs are considered to be emergent wetlands. Perennials plants are most common that cover approximately 30 percent of the wetland. It is common in the Midwest region of the United States for emergent wetlands to periodically revert to an open water phase because of erratic climatic fluctuations; otherwise, they maintain the same appearance throughout all seasons.[28]

The freshwater forested/shrub wetland is a combination of forest and scrub-shrub wetlands. These wetland complexes are likely to exhibit a wide variety of woody plants (e.g., shrubs, young and stunted trees, as well as mature trees that are of at least 20 feet tall) interspersed with herbaceous (non-woody) layer. Scrub-shrub wetlands can often be representative of a wetland transitioning into a forested wetland; this is likely the case for the freshwater forested/shrub wetlands in the Lower Salt Creek planning area. Forested wetlands are commonly found along rivers where there is abundant moisture, and nearly 63% of the freshwater forest/shrub wetlands are located along the main tributaries of Salt Creek.[29]

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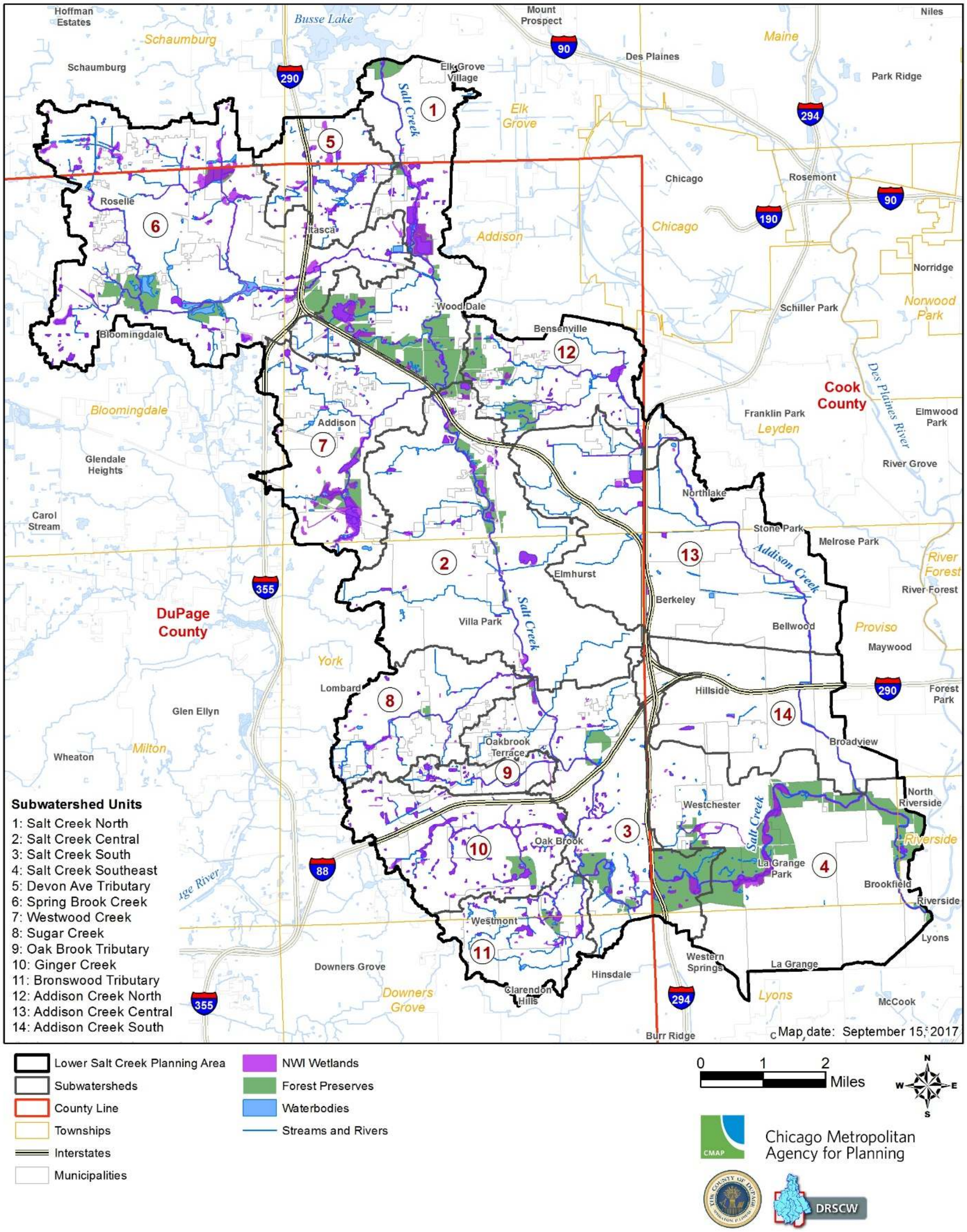
[28] Cowardin, Lewis M. et al., 2013. Classification of Wetlands and Deepwater Habitats of the United States 2nd Edition. https://www.fws.gov/wetlands/Documents/Classification-of-Wetlands-and-Deepwater-Habitats-of-the-United-States-2013.pdf (accessed October 26, 2016).

[29] Cowardin, Lewis M. et al., 2013. Classification of Wetlands and Deepwater Habitats of the United States 2nd Edition. https://www.fws.gov/wetlands/Documents/Classification-of-Wetlands-and-Deepwater-Habitats-of-the-United-States-2013.pdf (accessed October 26, 2016).

Table 12. Wetlands by subwatershed.

Study Unit #	*Subwatershed Unit Name*	*Wetland Area (Acres)*	*Percent of Study Unit*
1	Salt Creek North	299.3	6.1%
2	Salt Creek Central	148.1	1.9%
3	Salt Creek South	124.8	2.5%
4	Salt Creek Southeast	196.9	2.5%
5	Devon Avenue Tributary	80.7	4.0%
6	Spring Brook Creek	381.3	4.0%
7	Westwood Creek	198.6	5.2%
8	Sugar Creek	40.3	1.5%
9	Oak Brook Tributary	34.2	4.5%
10	Ginger Creek	173.3	5.0%
11	Bronswood Tributary	71.7	3.4%
12	Addison Creek North	79.7	2.6%
13	Addison Creek Central	81.2	1.1%
14	Addison Creek South	17.6	0.5%
	Totals	2,034.7	

Figure 16. Wetlands in the Lower Salt Creek planning area.



3.3.8 Oak Communities

Prior to European settlement, oak-dominated communities (oak barrens, savanna, woodland, or forest) covered substantial portions of Cook and DuPage Counties.[30] Presettlement land cover from the 1830s indicates that 7,828.3 acres of the Lower Salt Creek planning area was covered in forest most likely made up of oak-dominated communities. By 1939, only 28 percent of Cook County's and 44 percent of DuPage County's land area was covered with oak ecosystems. Between 1939 and 2010, Cook County lost approximately 8,259 acres of oak ecosystems; DuPage County lost 12,842 acres. This is approximately a 46 and 54 percent decline, respectively, in oak ecosystem cover across the two counties.

A similar declining trend is present in the Lower Salt Creek watershed. As of 2010, oak ecosystems occupy approximately 2,188.3 acres (3.4 sq. miles) of the planning area (Table 13, Figure 17), over half of which resides within or along the edges of the forest preserves. In 1939, oak ecosystems covered approximately 4,982.5 acres (7.7 percent of the planning area). This is equivalent to a 56.1 percent reduction in oak ecosystem coverage. Of the oak ecosystems remaining in the planning area, approximately 56 percent are located within DuPage County, which is equivalent to 17.8 percent of DuPage's County's entire oak ecosystem coverage.

Table 13. Oak communities in the Lower Salt Creek planning area, 1830s to 2010.[31]

Year	*Area* (acres)	*Area* (sq. miles)	*Percent of Planning Area*
1830s	7,828.3	12.2	12.1
1939	4,982.5	7.8	7.7
2010	2,188.3	3.4	3.4

On a subwatershed study unit basis, Salt Creek South has the greatest oak ecosystems coverage with 10.8 percent accounting for its total acreage (Table 14). Salt Creek Southeast and Addison Creek North also have adequate coverage at 8.7 percent and 7.3 percent, respectively.

Identification of remaining natural areas, including oak dominated communities, supports conservation efforts and should be used as a tool to preserve important natural landscapes and establish greenways. New conservation opportunities and best management projects aimed at restoring natural vegetation and biodiversity may be identified and implemented in order to

[30] Chicago Wilderness, 2015. *Oak ecosystems recovery plan: Sustaining oaks in the Chicago wilderness region*. https://www.dnr.illinois.gov/conservation/IWAP/Documents/Chicago%20Wilderness%20Oak%20Ecosystem%20Recovery%20Plan.pdf (accessed October 26, 2016).

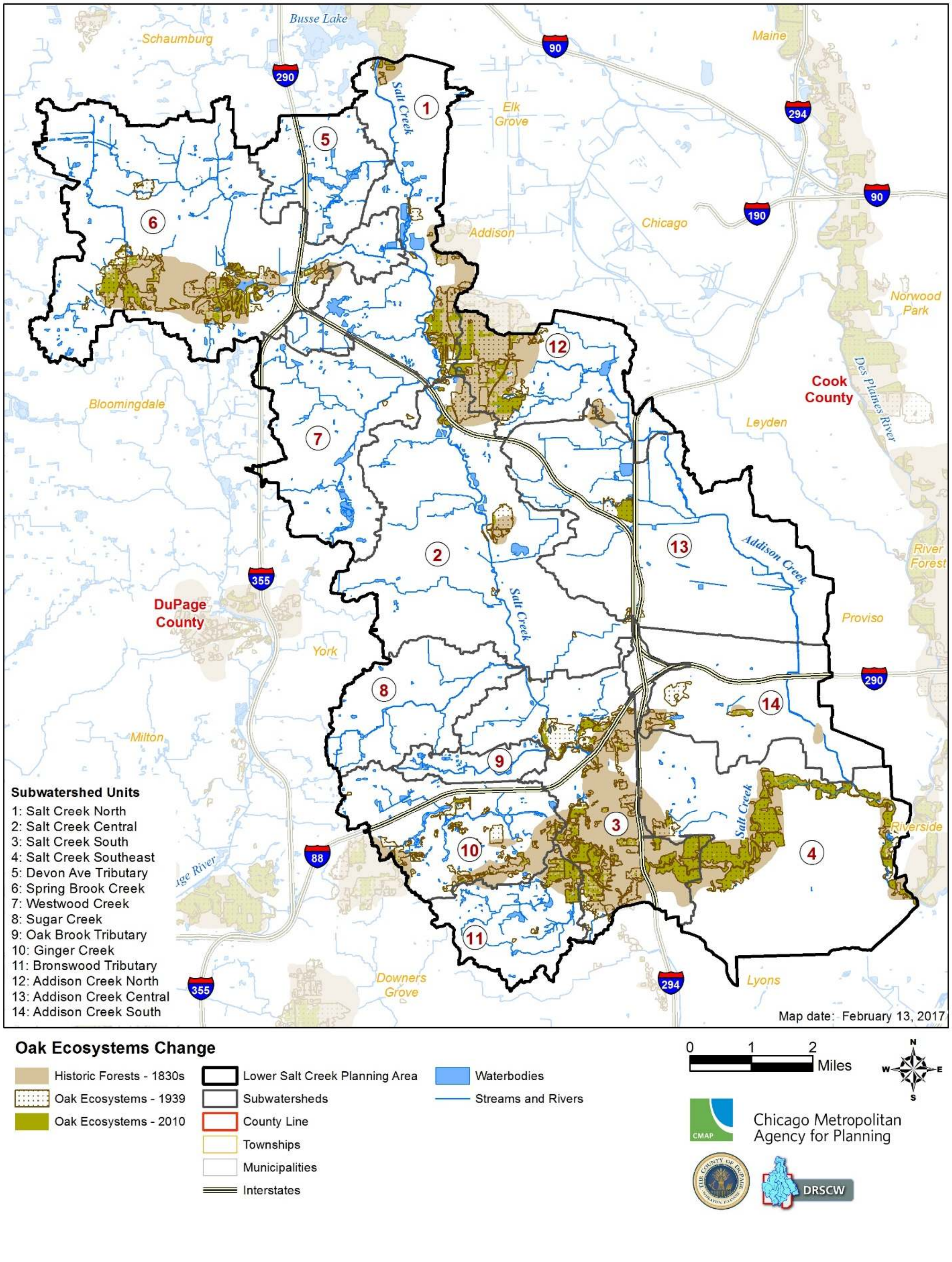
[31] 1830s data reflects forested areas throughout Illinois in the early 1800s. Data was derived from the Illinois Natural History Survey (INHS) GIS database published in August 2002. http://wwx.inhs.illinois.edu/resources/gis/glo/.

provide links between fragmented habitats as well as provide stormwater management benefits through retainment of pervious cover.

Table 14. Existing (2010) oak communities by subwatershed.

Study Unit #	*Subwatershed Unit Name*	*Area of Oaks (Acres)*	*Percent of Study Unit*
1	Salt Creek North	157.6	3.2%
2	Salt Creek Central	25.2	0.3%
3	Salt Creek South	542.5	10.8%
4	Salt Creek Southeast	697.9	8.7%
5	Devon Avenue Tributary	0.0	0.0%
6	Spring Brook Creek	330.7	3.5%
7	Westwood Creek	0.0	0.0%
8	Sugar Creek	0.0	0.0%
9	Oak Brook Tributary*	0.8	0.1%
10	Ginger Creek	38.2	1.1%
11	Bronswood Tributary	107.2	5.1%
12	Addison Creek North	222.5	7.3%
13	Addison Creek Central	50.2	0.7%
14	Addison Creek South	15.4	0.4%
	Total	**2,188.3**	**---**

Figure 17. Oak Ecosystems Change in the Lower Salt Creek, 1830-2010



3.4 Land Use and Land Cover

3.4.1 Current Land Use

Land use is classified using CMAP's 2013 Land Use Inventory Classification Scheme. The land-use scheme employs a new methodology and results in 57 categories of land use that are aggregated under five general categories: Urbanized, Agriculture, Open Space, Vacant or Under Construction, and Water. CMAP's land-use data is parcel based.

For purposes of this plan, land use within the planning area is organized among eleven categories (Figure 18, Table 15, and Table 16). Residential (38.01 percent) and transportation, communications, and utilities (23.87 percent) land uses are the most dominant within the planning area. Open space is the third most common type of land use (15.42 percent) followed by industrial and commercial land uses at 7.63 and 7.03 percent, respectively.[32] Land use within each subwatershed study unit boundary was tabulated by the eleven categories as well (Table 16). Spring Brook Creek and Salt Creek Southeast are two study units with the most residential land uses (3,623 acres and 3,162 acres, respectively), while Addison Creek Central has the most industrial land uses (1,205 acres). Understanding the land use composition at this scale is useful for understanding and comparing pollutant loads generated from each subwatershed and targeting BMP strategies to reduce loads.

Table 15. Land-use categories and extent within planning area.

Land Use Category	*Area (acres)*	*Area (sq. miles)*	*Percent of Planning Area*
Residential	24,492.4	38.3	38.01
Commercial	4,527.3	7.1	7.03
Institutional	3,736.3	5.8	5.80
Industrial	4,919.1	7.7	7.63
Open Space	9,937.1	15.5	15.42
Agriculture	29.5	0.0	0.05
T/C/U	15,379.8	24.0	23.87
Vacant	1,366.2	2.1	2.12
Under Construction	14.5	0.0	0.02
Unclassifiable/other*	12.4	0.0	0.02
Water	18.3	0.0	0.03
Totals	**64,432.9**	**100.7**	**100**

T/C/U = transportation, communications, and utilities;
*Unclassifiable/other includes right-of-ways and non-parcel areas.

[32] Open Space and Vacant or Under Construction are two examples of land use that warrant explanation. Readers are encouraged to review a more detailed description of land-use categories at http://www.cmap.illinois.gov/data/land-use/inventory.

Figure 18. Land use in the Lower Salt Creek planning area.

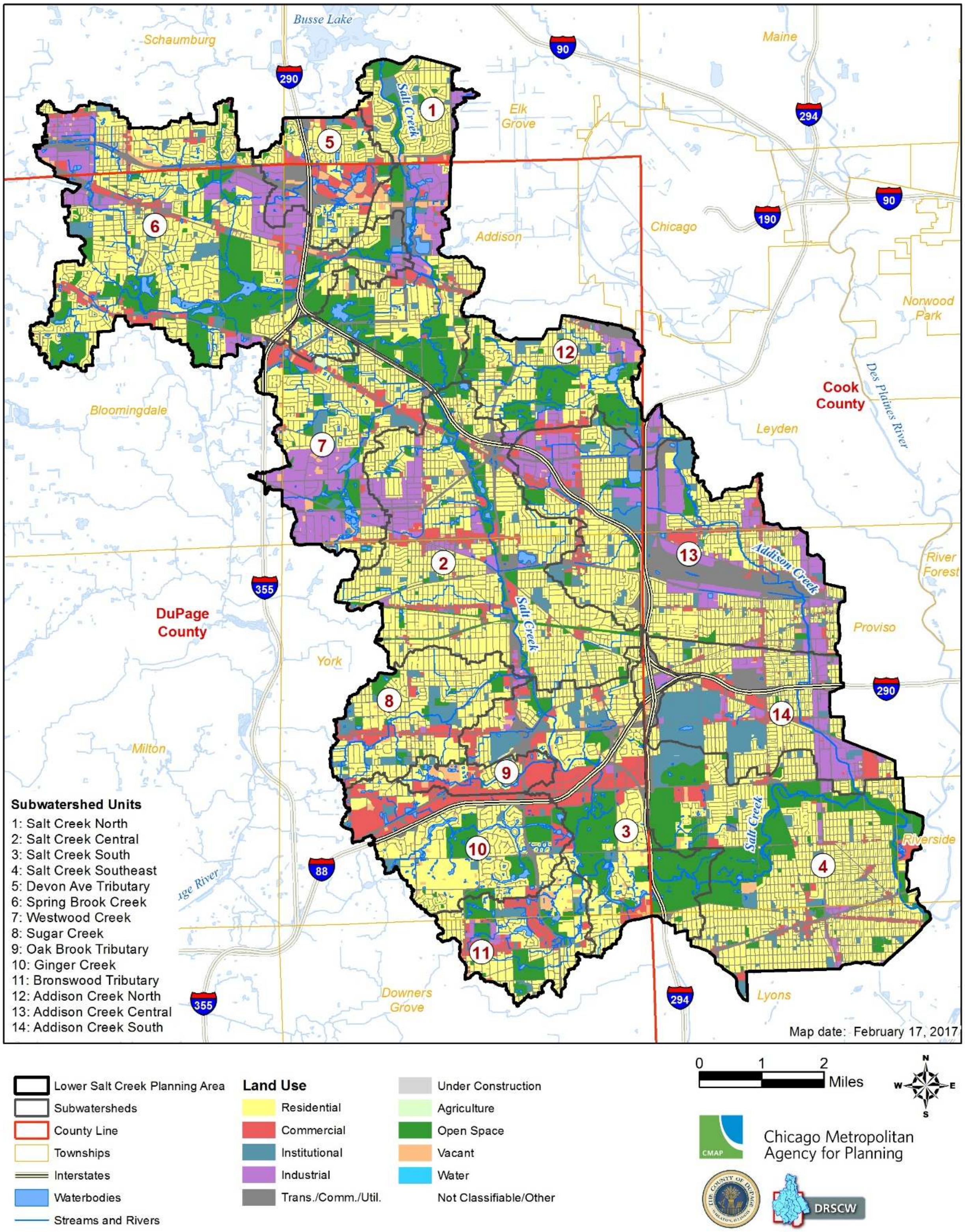


Table 16. Land use (acres) by study unit within Lower Salt Creek planning area.

Land Use Category	*Salt Creek North*	*Salt Creek Central*	*Salt Creek South*	*Salt Creek Southeast*	*Devon Ave Trib.*	*Spring Brook Creek*	*Westwood Creek*
Subwatershed/ Unit #	1	2	3	4	5	6	7
Residential	1,659	3,911	1,598	3,162	692	3,623	1,186
Commercial	183	404	625	317	256	400	223
Institutional	182	220	307	505	68	334	195
Industrial	380	480	31	114	168	903	793
Open Space	1,225	712	1,393	1,898	66	1,950	431
Agriculture	6						23
T/C/U	1,086	2,073	975	1,906	657	2,019	810
Vacant	188	108	114	85	112	210	137
Under Construction		1	4	0	0	4	1
Unclassifiable/ other	0	0		0	0	0	
Water	1	0		7		0	
Totals	**4,911**	**7,911**	**5,046**	**7,995**	**2,020**	**9,443**	**3,798**

Land Use Category	*Sugar Creek*	*Oak Brook Tributary*	*Ginger Creek*	*Bronswood Tributary*	*Addison Creek North*	*Addison Creek Central*	*Addison Creek South*
Subwatershed/ Unit #	8	9	10	11	12	13	14
Residential	1,357	221	1,570	862	1,072	2,458	1,121
Commercial	214	291	585	271	67	454	238
Institutional	279	15	111	100	148	540	730
Industrial	26			58	257	1,205	503
Open Space	204	21	462	396	810	299	70
Agriculture					1		
T/C/U	472	116	660	319	616	2,675	997
Vacant	56	98	44	82	59	55	19
Under Construction	0		1	0		1	1
Unclassifiable /other		0	1		1	7	3
Water		0			0	4	6
Totals	**2,608**	**762**	**3,434**	**2,088**	**3,031**	**7,697**	**3,688**

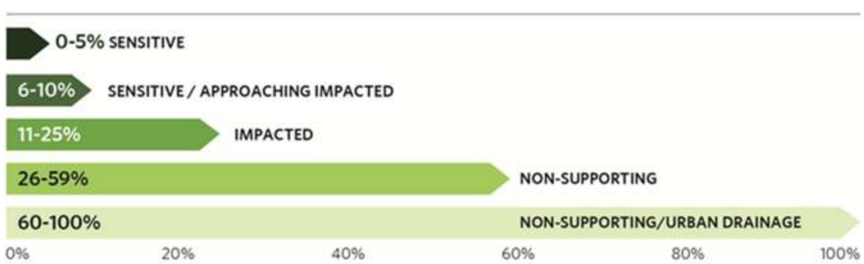
3.4.2 Impervious Surface

Impervious surface, that part of the landscape that is paved or covered with nonporous material (e.g., concrete, asphalt, roofs, etc.) prevents infiltration of rain and snowmelt and thus generates runoff and nonpoint source pollution. Impervious surface changes local hydrology which often leads to stream channel downcutting and widening. The resultant erosion of the streambank and streambed further aggravates water quality and can negatively impact land resources and infrastructure. Given the impacts of impervious surface on local hydrology, water quality, and other resources, this man-made feature of the landscape warrants special attention in any effort to protect or restore water quality.

The National Land Cover Database 2011 (NLCD 2011) is applied for the analyses featured in this plan.[33] The NLCD 2011 is the most recent Landsat-based, 30-meter resolution land cover database for the Nation. One product derived from these data is the NLCD 2011 Percent Developed Imperviousness. Each data point or pixel represents a remotely-sensed image of the Earth's surface—at a 30-meter resolution—that has an assigned value of imperviousness, ranging from 0 to 100 percent. Figure 20 displays the pattern and extent of impervious surface within the Lower Salt Creek planning area.[34] Data analysis reveals that nearly 95 percent of the planning area is covered with varying degrees of imperviousness, 43.7 percent of which is completely impervious.

For purposes of this plan, impervious surface is best understood in the context of its impact on stream quality. The percent of impervious cover is a widely used metric for estimating stream health at the watershed scale.[35] Figure 19 illustrates the relationship between stream health and the degree of impervious surface.

Figure 19. Stream health categories relative to extent of impervious surface.



Source: Center for Watershed Protection (2003)

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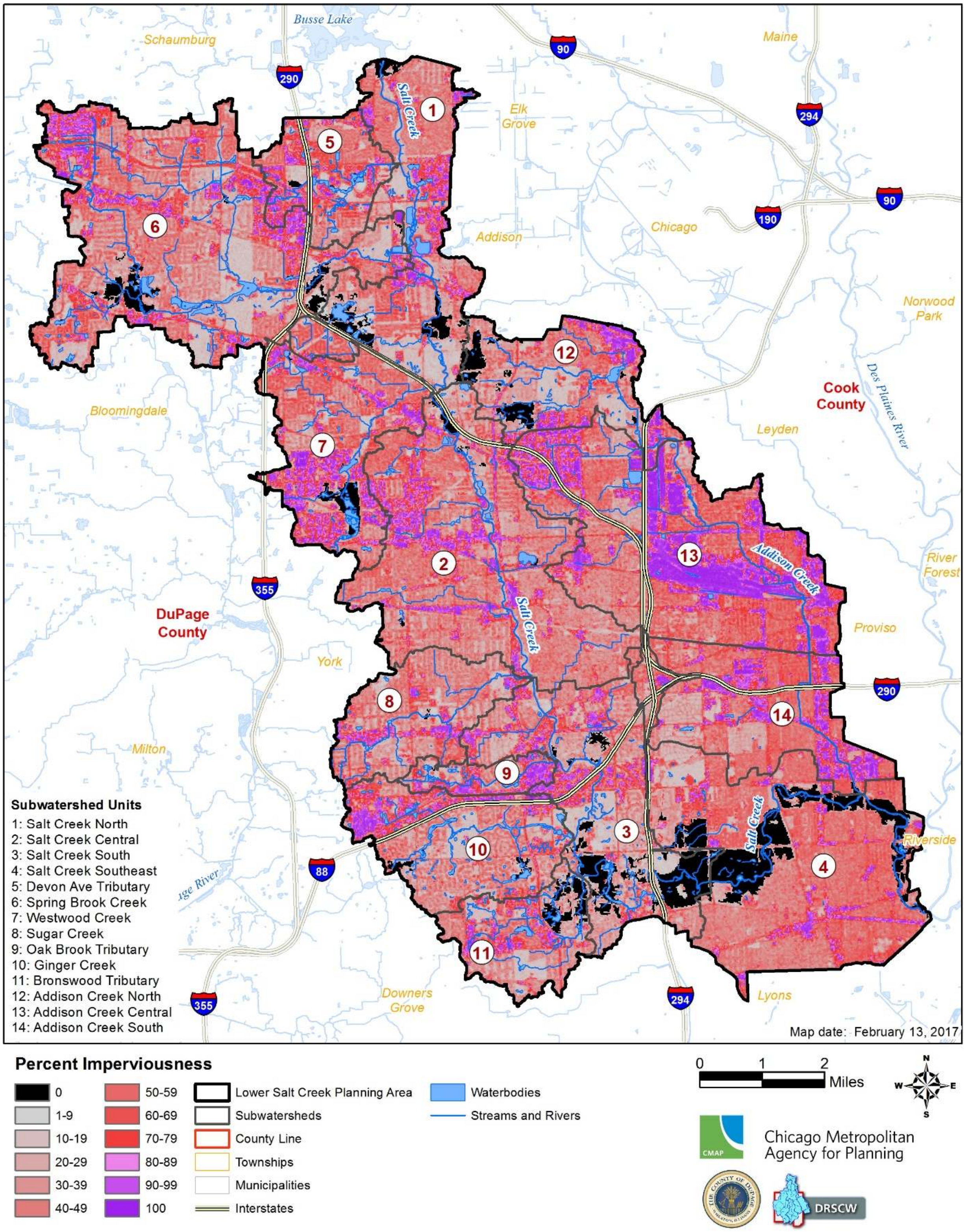
[33] Multi-Resolution Land Characteristics Consortium (MRLC), National Land Cover Database. Available at: http://www.mrlc.gov/

[34] Pixels shaded black feature 0 percent impervious surface. Beginning with shades of gray – from light to dark – and then switching to shades of red – from pink to purple – pixels represent impervious surface from 1-100 percent.

[35] Scheuler, T.R. (2009) "Is Impervious Cover Still Important? Review of Recent Research." *Journal of Hydrologic Engineering*., 14(4), 309-315.

Figure 20. Impervious surface (0-100%) in the Lower Salt Creek planning area.

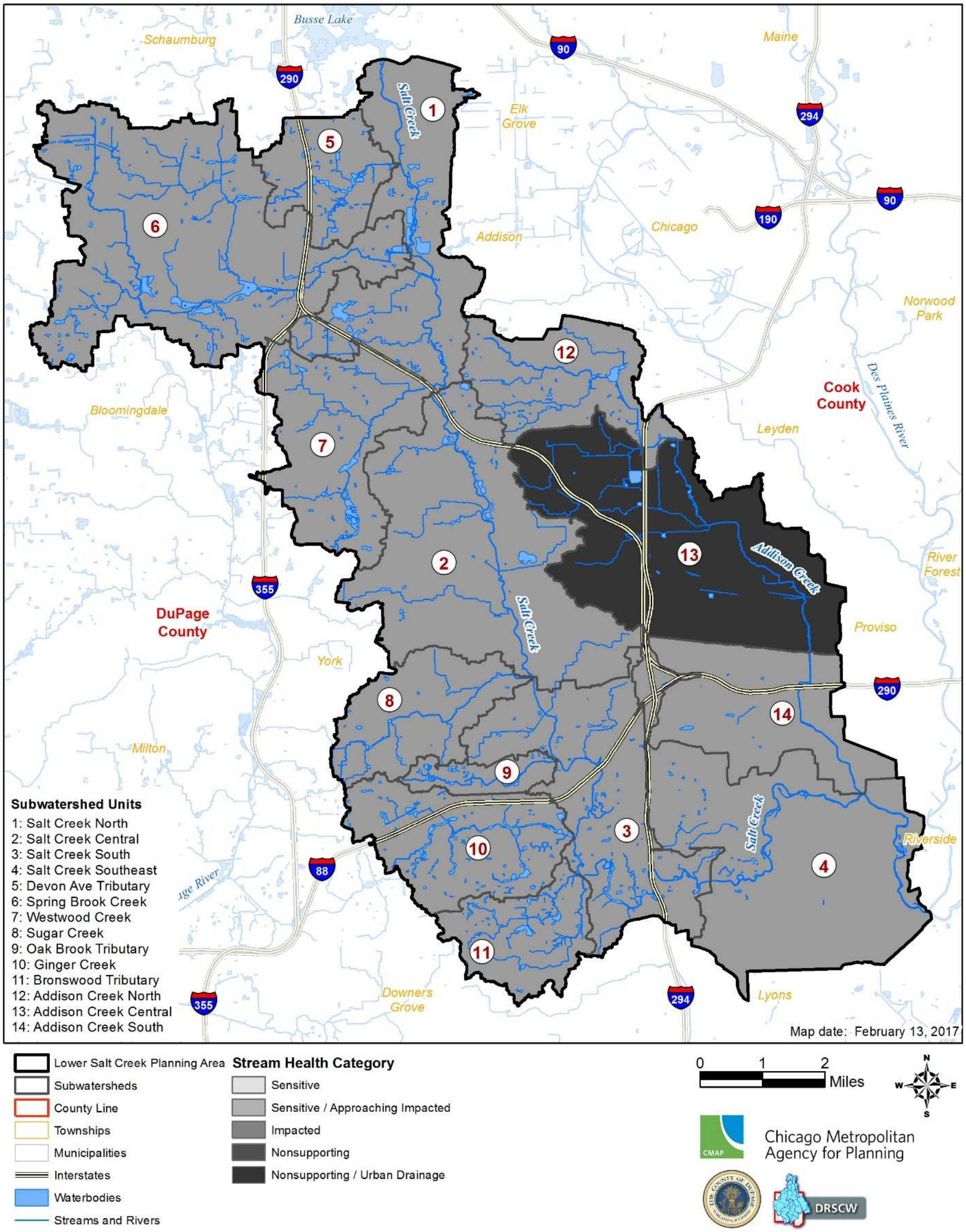


The relationship between impervious surface and stream quality is best examined at smaller units of geography, such as the subwatershed scale. More localized land areas of less spatial extent typically have more direct impacts on the overall health of nearby lakes and streams. Table 17 shows the relationship between the impervious surface extent for the fourteen subwatershed units within the Lower Salt Creek watershed and the resultant stream health category. The stream health for thirteen of the subwatershed units fall within the non-supporting category, and one (Addison Creek Central) falls in the highest category of non-supporting / urban drainage with 61 percent of the subwatershed being completely impervious. Figure 21 illustrates the pattern of stream health categories across the planning area.

Table 17. Impervious surface and relationship with stream health by study unit.

Study Unit #	*Subwatershed Unit Name*	*Area (ac)*	*Impervious Surface Area (ac)*	*Percent Impervious Surface*	*Stream Health Category*
1	Salt Creek North	4,911	1,837	37.4	Non-supporting
2	Salt Creek Central	7,911	3,464	43.8	Non-supporting
3	Salt Creek South	5,046	1,695	33.6	Non-supporting
4	Salt Creek Southeast	7,995	3,129	39.1	Non-supporting
5	Devon Avenue Tributary	2,020	970	48.0	Non-supporting
6	Spring Brook Creek	9,443	3,707	39.3	Non-supporting
7	Westwood Creek	3,798	1,918	50.5	Non-supporting
8	Sugar Creek	2,608	1,033	39.6	Non-supporting
9	Oak Brook Tributary	762	403	52.9	Non-supporting
10	Ginger Creek	3,434	1,417	41.3	Non-supporting
11	Bronswood Tributary	2,088	733	35.1	Non-supporting
12	Addison Creek North	3,031	1,144	37.7	Non-supporting
13	Addison Creek Central	7,697	4,692	61.0	Non-supporting / Urban Drainage
14	Addison Creek South	3,688	1,997	54.2	Non-supporting
	Totals	**64,433.0**	**28,140**	**43.7**	**Nonsupporting**

Figure 21. Status of stream health as a function of impervious surface extent.



3.4.3 Open Space Reserve

An open space reserve is an area of land and/or water that is protected or conserved such that development will not occur on that location at any time during the foreseeable future. Within the Lower Salt Creek watershed, the reserve encompasses 9,937 acres of dedicated open space. As shown in Figure 22, more than half of the reserve (approximately 4,817 acres) is owned and managed by the Forest Preserve District of DuPage County (FPDDC) and Forest Preserves of Cook County (FPCC). Public parks, greenways and trails, private land protected by conservation easements, as well as golf courses and natural lands owned or managed by the Illinois Department of Natural Resources (IDNR) are also included within the reserve. Golf courses were included in the reserve because many are located within the forest preserves.

The open space reserve holdings were compiled from a variety of sources, including the Forest Preserve District of DuPage County, Forest Preserves of Cook County, the Illinois Department of Natural Resources, the National Conservation Easement Database, and CMAP land use inventories. Of the 14 subwatershed units that make up the Lower Salt Creek watershed, Salt Creek North, Salt Creek South, and Addison Creek North have the most open space relative to the size of the study units (see Table 19). On the other hand, Addison Creek South and Oak Brook Tributary have the least amount of open space (between 1-2% coverage) relative to the size of the study units. Subwatershed units that do not encompass a substantial amount of the open space reserve highlights opportunity areas for the creation of new open space as well as habitat improvements.

Table 18. Open Space Reserve Holdings[36]

Open Space Reserve	*Area (acres)*	*Percent of Planning Area*
IDNR natural areas / nature preserves	353	0.5
Parks, greenways, and trails	2,213	3.4
Forest preserves	4,817	7.4
Golf courses	3,438	5.3
Conservation easements	16	0.02
Totals	**9,937**	**14.5**

[36] The acreage breakdown of the open space reserve by land holding type exceeds the total acreage of the open space reserves because golf courses and IDNR natural area / nature preserves overlap with forest preserve property.

Figure 22. Open space in the Lower Salt Creek planning area.

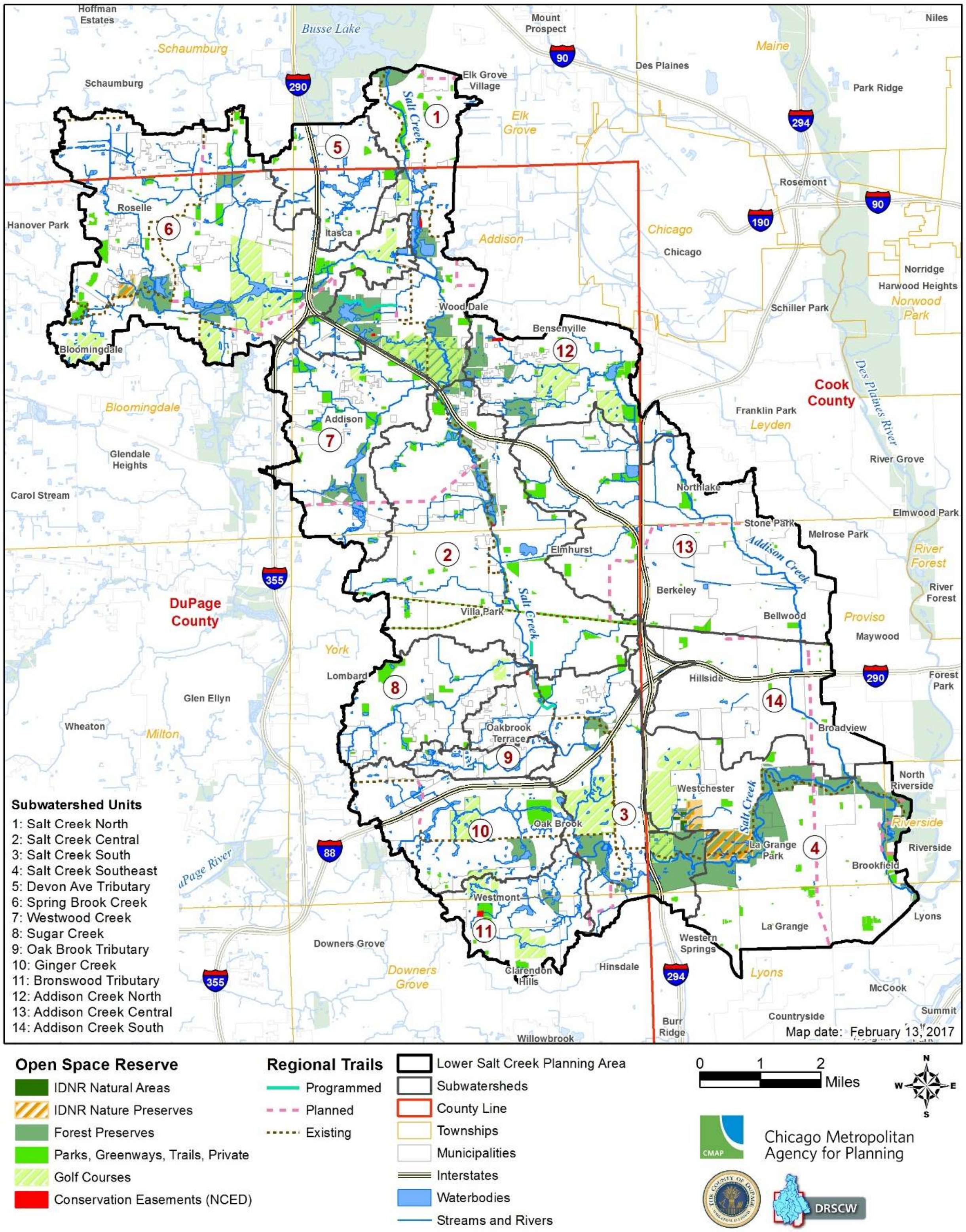


Table 19. Open space reserve by subwatershed.

Study Unit #	*Subwatershed Unit Name*	*Open Space (Acres)*	*Study Unit (Acres)*	*Percent of Study Unit*
1	Salt Creek North	1,346.6	4,910.6	27.4%
2	Salt Creek Central	675.9	7,911.0	8.5%
3	Salt Creek South	1,337.4	5,045.9	26.5%
4	Salt Creek Southeast	1,978.9	7,995.0	24.8%
5	Devon Avenue Tributary	56.8	2,020.5	2.8%
6	Spring Brook Creek	1,902.9	9,443.5	20.2%
7	Westwood Creek	431.1	3,798.4	11.3%
8	Sugar Creek	203.7	2,608.1	7.8%
9	Oak Brook Tributary	14.1	762.4	1.8%
10	Ginger Creek	461.9	3,433.7	13.5%
11	Bronswood Tributary	362.5	2,087.6	17.4%
12	Addison Creek North	805.5	3,031.2	26.6%
13	Addison Creek Central	284.5	7,697.4	3.7%
14	Addison Creek South	70.9	3,687.6	1.9%
	Totals	9,932.5	64,432.9	

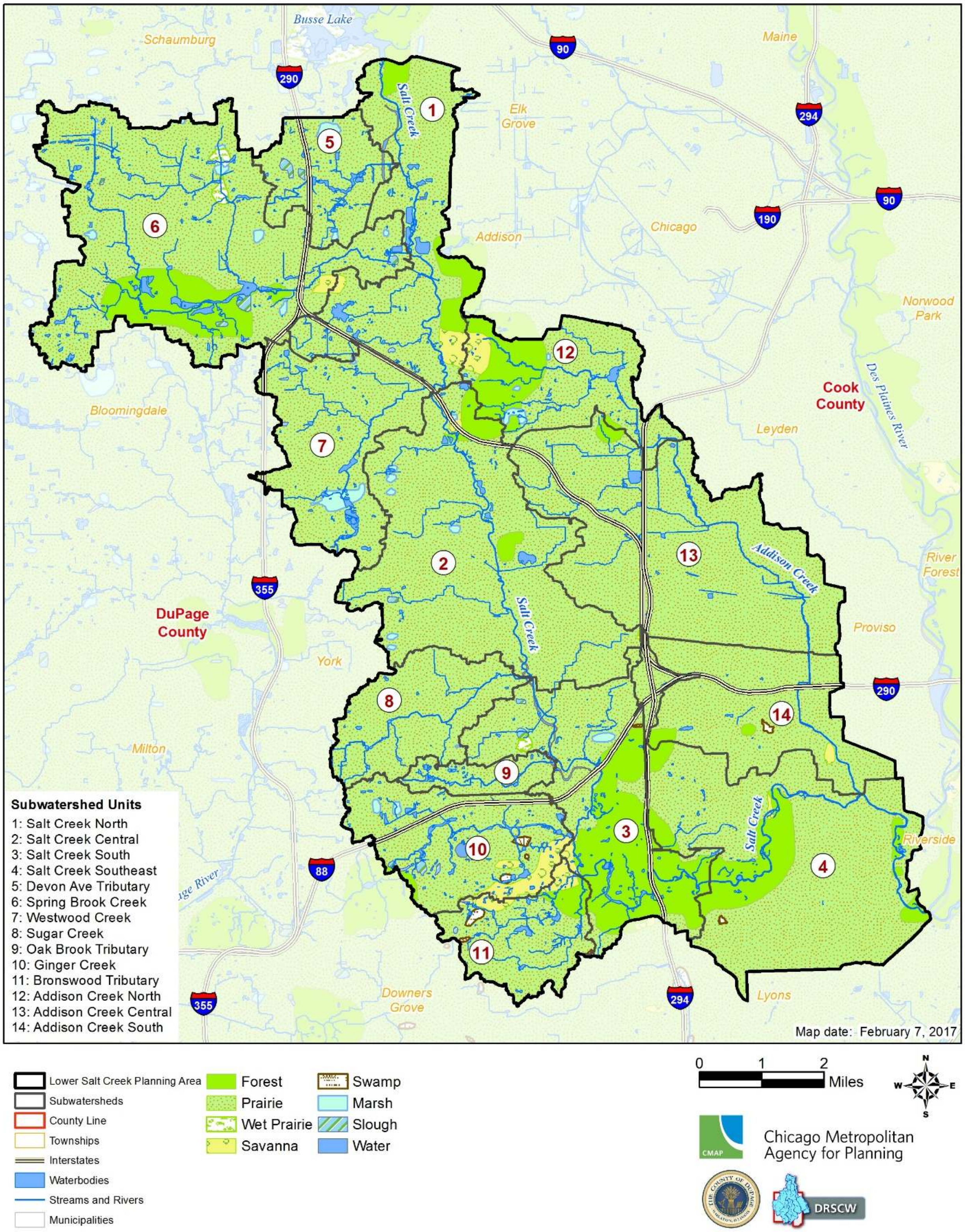
3.4.4 Presettlement Land Cover

For a qualitative sense of historical land use change, Figure 23 shows the presettlement land cover in and around the Lower Salt Creek planning area as surveyed during the initial stages of Euro-American settlement in the early 1800s[37]. The results from the initial survey have been supplemented by Morton Arboretum to include the most probable ecosystem types for areas that had already been developed when the survey was conducted. Prior to development, prairieland dominated the planning area. Pockets of forest and wetlands (categorized as bottomland, slough, swamp, or other wetland types)[38] were also present. This historic land cover can be informative for current land use planning and ecological restoration project purposes.

[37] Illinois Natural History Survey. INHS GIS database. *Land cover of Illinois in the early 1800s*. (August 2002) http://wwx.inhs.illinois.edu/resources/gis/glo/.

[38] Swamps are wetlands dominated by trees or shrubs. A slough is another term for a swamp or shallow lake system. Bottomland wetlands are lowlands along streams and rivers, usually on alluvial floodplains that are periodically flooded (from Mitsch, W.J. and J.G. Gosselink. 1986. *Wetlands*. Van Nostrand Reinhold Co. Ltd., New York, NY).

Figure 23. Presettlement land cover in the Lower Salt Creek planning area.



3.5 Water Resource Conditions

3.5.1 Watershed Drainage System

Water in the Lower Salt Creek Watershed planning area generally flows from north-northwest to south-southeast. For the extent of this plan, Salt Creek originates at the outlet of Busse Lake approximately 1.5 miles north of the DuPage-Cook County border and enters the Des Plaines River in western Cook County. The Lower Salt Creek planning area is comprised of three HUC 12 watersheds: Middle Salt Creek, Lower Salt Creek, and Addison Creek. As noted previously, the 100 square mile planning area has been further subdivided into 14 subbasins or "study units" (Figure 4). Numerous ponds, wetlands, stormwater detention basins, and flood control facilities also serve as storage features and conduits for watershed drainage.

3.5.2 Physical Stream Conditions[39]

3.5.2.1 Introduction and Methods

The DuPage River Salt Creek Workgroup (DRSCW) conducted a stream inventory for the Lower Salt Creek watershed in the summer of 2016 and winter of 2017. For the purposes of the stream inventory, the Lower Salt Creek stream network was divided into reaches, which are smaller, geographically defined segments of the stream. Features such as dams, bridges, road and railroad crossings, and changes in land use were used to define the upstream and downstream limits of each reach. The Lower Salt Creek stream network was divided into 441 reaches (71.81 miles). The average length of assessed reaches in the Lower Salt Creek inventory is 929.4 feet.

The following types of data were collected during the inventory:

- Channelization
- Bank Erosion
- Riparian Width
- Debris Jams

The stream inventory data was assembled from a variety of means and methods. Data sources include the 2017 Salt Creek Stream Inventory, the 2016 Salt Creek Bioassessment, the 2014 Sugar Creek watershed stream assessment, and the 2010 Salt Creek Stream Assessment for TMDL watersheds.

Field data collected by the DRSCW as part of the 2016 Salt Creek Bioassessment was used as the baseline for the survey. The 2016 data included physical habitat quality that was evaluated using the Qualitative Habitat Evaluation Index (QHEI) at 21 sites along the Salt Creek main

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[39] This section was written by Deanna Doohaluk, DRSCW, provided via email correspondence to CMAP. The accompanying maps were made by CMAP from data provided by DRSCW.

stem, 6 sites in the Springbrook Creek watershed, 1 site on Westwood Creek, 6 sites in the Addison Creek watershed, 1 site on Sugar Creek, 2 sites on the Oak Brook Tributary, and 2 sites on Ginger Creek. At each site, the data collected represents approximately 600-foot sections or "reaches" at wadable sites and 1600-foot reaches at non-wadable sites. Data obtained from the QHEI utilized in the physical stream condition survey includes channelization, bank erosion, and riparian width. See Section 3.5.5.2 for additional information on the QHEI data collected in the Lower Salt Creek watershed.

For reaches located outside of the QHEI assessment area, the DRSCW conducted additional field observations during winter 2017 to collect channelization, bank erosion, riparian width, and debris jam data along the main stems of Salt Creek and Addison Creek. In order to standardize the inventory, the 2017 field work utilized QHEI methods and evaluation criteria for all assessed parameters. This field work, along with the analysis of high-resolution aerial imagery, was used to complete the stream inventory for the main stems of Salt Creek and Addison Creek. Information on debris jams and bank erosion from the 2010 Salt Creek Stream Assessment for TMDL watersheds was also integrated into the inventory.

Additionally, in 2014, DuPage County conducted a stream assessment of Sugar Creek. Although the Sugar Creek stream assessment utilized a different assessment methodology and reporting form that the work conducted by the DRSCW, the information obtained during the assessment was documented in such a way that the information could be interrupted using the metrics utilized by the DRSCW. For the purposes of the stream inventory, the data collected in Sugar Creek is presented using the same evaluation metrics as the data collected by the DRSCW.

3.5.2.2 Stream Network Description

The stream inventory was focused on the main stem of Salt Creek and the main stem of Addison Creek from its confluence with Salt Creek and north to Roosevelt Road. Additionally, those portions of Salt Creek tributaries where existing data was available were included in the stream inventory. In summary, of the 441 reaches in the watershed, 204 reaches (37.35 miles) were assessed in the inventory (Table 20).

Table 20. Total versus assessed stream miles in the Lower Salt Creek planning area.

	Salt Creek	Addison Creek	Salt Creek Tributaries	Totals
Total stream miles	30.73	12.06	29.02	71.81
Total stream miles assessed	30.73	1.68	4.67	37.08
Percent assessed	100%	13.9%	16.1%	51.6%

<u>**Salt Creek**</u>

The main stem Salt Creek watershed has been divided into three subwatersheds: Salt Creek North, Salt Creek Central, and Salt Creek South. The flow paths of the three Salt Creek subwatersheds are described below.

Salt Creek North (Subwatershed/Study Unit #1) – Busse Lake empties over its dam into Salt Creek. From the dam, Salt Creek flows in the southerly direction through the Busse Woods Forest Preserve until Arlington Heights Road. From Arlington Heights Road, the creek continues to flow south past Elk Grove High School and through a residential area to Devon Avenue. Many recreational areas and parks including Lions Park, Jaycee Park, Olmstead Park, Morton Park, and Burbank Park border Salt Creek through this reach. South of Devon, Salt Creek continues to flow in a southerly direction under I-390/Thorndale Road to Irving Park Road through a commercial/industrial area to the west and open space comprised of the Salt Creek Golf Course and Salt Creek Marsh Forest Preserve on the east. South of Irving Park Road, the creek then flows through a residential area and the Salt Creek Forest Preserve before flowing under Elizabeth Drive and though the Oak Meadows Golf Course. From the Oak Meadows Golf Course, Salt Creek flows under I-290.

Salt Creek Central (Subwatershed/Study Unit #2) – From the I-290 bridge, Salt Creek runs parallel to I-290 in a southeasterly direction through a mixed commercial/industrial and residential area before entering the Cricket Creek Forest Preserve at Fullerton Avenue. The creek then flows under US 64 and through a mixed commercial/industrial and residential area before entering the Salt Creek Elmhurst County Forest Preserve District south of the railroad tracks. From the Salt Creek Elmhurst County Forest Preserve District, Salt Creek continues to flow towards the southeast through a mixed commercial/industrial and residential area flowing under Kingery Highway to Eldridge Park.

Salt Creek South and **Salt Creek Southeast** (Subwatershed/Study Unit #3 and #4) – From Eldridge Park, Salt Creek flows under Butterfield Road, Roosevelt Road, I-88 and 22nd Avenue before entering the Oakbrook Golf Course and Butler National County Club. South of the golf courses, the creek flows under 31st Street and then turns to the east flowing through the Fullersburg Woods Forest Preserve and then a residential area before flowing under I-294. From I-294, Salt Creek continues to flow in an easterly direction through Bemis Woods Forest Preserve and Salt Creek Woods Forest Preserve. Salt Creek then flows to the north/northeasterly direction through the Possum Hollow Woods Forest Preserve before turning to the east at US 12/45. After flowing under US 12/45, Salt Creek flows in a northeasterly direction through Brezina Woods Forest Preserve and Twenty-Sixth Street Woods Forest Preserve before turning to the south near 31st Street. From 31st Street, the creek flows in a southerly direction through the Brookfield Zoo and a mixed residential and commercial area before meeting its' confluence with the Des Plaines River in the Plank Road Meadows Forest Preserve just west of 1st Avenue.

<u>Addison Creek</u>

The Addison Creek Watershed has been divided into three subwatershed: Addison Creek North, Addison Creek Central, and Addison Creek South. The flow paths of the three Addison Creek subwatersheds are described below.

Addison Creek North and **Addison Creek Central** (Subwatershed/Study Unit #12 and #13) - The Addison Creek North and Addison Creek Central subwatersheds were excluded from the inventory due to a planned Metropolitan Water Reclamation District of Greater Chicago (MWR) project that will significantly modify the stream channel and riparian area of Addison Creek upstream of Roosevelt Road.

Addison Creek South (Subwatershed/Study Unit #14) **-** From Roosevelt Road, Addison Creek flows in a southeasterly direction through an industrial area parallel to the railroad tracks until Gartner Road. From Gartner Road, the creek continues to run towards the southeast though an industrial and commercial area flowing under Cermack Road. South of Cermack Road, Addison Creek flows through the Twenty-Sixth Street Woods Forest Preserve before meeting its confluence with Salt Creek just west of 17th Avenue.

Salt Creek Tributaries

Devon Avenue Tributary (Subwatershed/Study Unit #5) – The Devon Avenue Tributary subwatershed is situated in the north central portion of the Lower Salt Creek watershed in the Village of Itasca and unincorporated DuPage County. The headwaters of the Devon Avenue Tributary are located near the intersection of I-290 and I-390. The waterway of the Devon Avenue Tributary is comprised of a series of detention basins, storms sewer pipes, and drainage swales draining a mixed commercial and industrial area. The Devon Avenue Tributary confluence with Salt Creek is located immediately south of the Devon Avenue bridge.

Spring Brook Creek (Subwatershed/Study Unit #6) – The Spring Brook Creek subwatershed is located in the northwest portion of the Lower Salt Creek watershed in the Villages of Roselle, Bloomingdale, and Itasca and unincorporated DuPage County. Spring Brook Creek generally flows in an easterly direction through a predominately residential area. Both the Medinah Country Club and Itasca County Club are located along Spring Brook Creek. Spring Brook Creek's confluence with Salt Creek is situated in the Salt Creek Marsh Forest Preserve east of North Prospect Avenue.

Spring Brook Creek has one major tributary, Meacham Creek. The headwaters of Meacham Creek are located near the intersection of I-390 and Meacham Road/Medinah Road. Meacham Creek flows in a southerly direction to its confluence with Spring Brook Creek within the Medinah County Club.

Westwood Creek (Subwatershed/Study Unit #7) – The Westwood Creek subwatershed is located in the northwest central portion of the Lower Salt Creek watershed in the Village of Addison and unincorporated DuPage County. The headwaters of Westwood Creek can be found near the intersection of Woodland Avenue and 7th Street in in Addison. Westwood Creek generally flows in an easterly direction through a predominately residential area. Westwood Creek's confluence with Salt Creek is located north of the Addison North POTW on the east of Addison Road.

Sugar Creek (Subwatershed/Study Unit #8) – The Sugar Creek subwatershed is located in the southwest central portion of the Lower Salt Creek watershed in the Villages of Lombard and

Villa Park and unincorporated DuPage County. The headwaters of Sugar Creek are located near IL 38 and Edgewood Avenue in the Village of Lombard. From its headwaters, Sugar Creek generally flows in a northeasterly direction through a mixed commercial/industrial and residential area. Sugar Creek's confluence with Salt Creek is located at Maple Trail Woods Forest Preserve near Sunnyside Avenue.

Oak Brook Tributary (Subwatershed/Study Unit #9) – The Oak Brook Tributary subwatershed is located south of the Sugar Creek subwatershed in the Villages of Lombard and Oak Brook and City of Oak Brook Terrace. The headwaters of the Oak Brook Tributary are situated near the intersection of Royce Boulevard Renaissance Boulevard in the Village of Oak Brook Terrace. The Oak Brook Tributary generally flows in an easterly direction through a predominately commercial area. The Oak Brook Tributary's confluence with Salt Creek is located near the northeast corner of the Oak Brook Center shopping mall.

Ginger Creek (Subwatershed/Study Unit #10) - The Ginger Creek subwatershed is located south of the Oak Brook Tributary subwatershed in the Village Oak Brook. The headwaters of Ginger Creek are located near the intersection of 31st Street and Midwest Club Parkway in the Village of Oak Brook. From its headwaters, Ginger Creek generally flows in an easterly direction through a predominately residential area. The Butterfield Country Club is located within the subwatershed. Ginger Creek's confluence with Salt Creek is located just east of the Ronald McDonald House Charities building on Ronald Lane.

Bronswood Tributary (Subwatershed/Study Unit #11) – The Bronswood Tributary subwatershed is located in the southwest portion of the Lower Salt Creek watershed in the Villages of Oakbrook, Hinsdale, Westmont, and Clarendon Hills. Two creeks make up the Bronswood Tributary stream system. The headwaters of northern most creek are located within the Oak Brook Hills Resort and the headwaters of the southern creek are located near the intersection of Richmond Avenue and Traube Avenue in the Village of Westmont. From its headwaters, the Bronswood Tributaries generally flows in a northeasterly direction through a mixed commercial and residential area. The Oak Brooks Hills Resort, the Hinsdale Golf Club and Bronswood Cemetery are located within the subwatershed. The Bronswood Tributary's confluence is within the Fullersburg Wood Forest Preserve upstream of the Fullersburg Woods dam.

3.5.2.3 Channelization

Channelization is the practice of dredging and straightening stream channels to increase flow rates and carrying capacities. Traditionally, channelization was done to move as much water as possible away from an area in a short period of time and prevent flooding. In a channelized stream, many of the natural stream features have been destroyed through the elimination of the meandering bends and the over-widening of the channel bottom.

There are problems resulting from channelization of streams and ditches. Channelization is detrimental for the health of streams and rivers through the elimination of suitable instream habitat for fish and wildlife by limiting the number of natural instream features such as pool-riffle sequences in the channel. Additionally, channelization has the effect of reducing the overall length of the stream and increasing the gradient of the channel. In both streams and constructed channels, channelization increased the speed at which runoff flows through the stream system. Because it is the nature of concentrated, flowing water to create meandering channels, channelized streams may be susceptible to bank instability and erosion.

As part of the physical stream condition survey prepared as part of the watershed-based planning the process, channelization in the Lower Salt Creek watershed was documented. The degree of channelization was assessed using the following classifications:

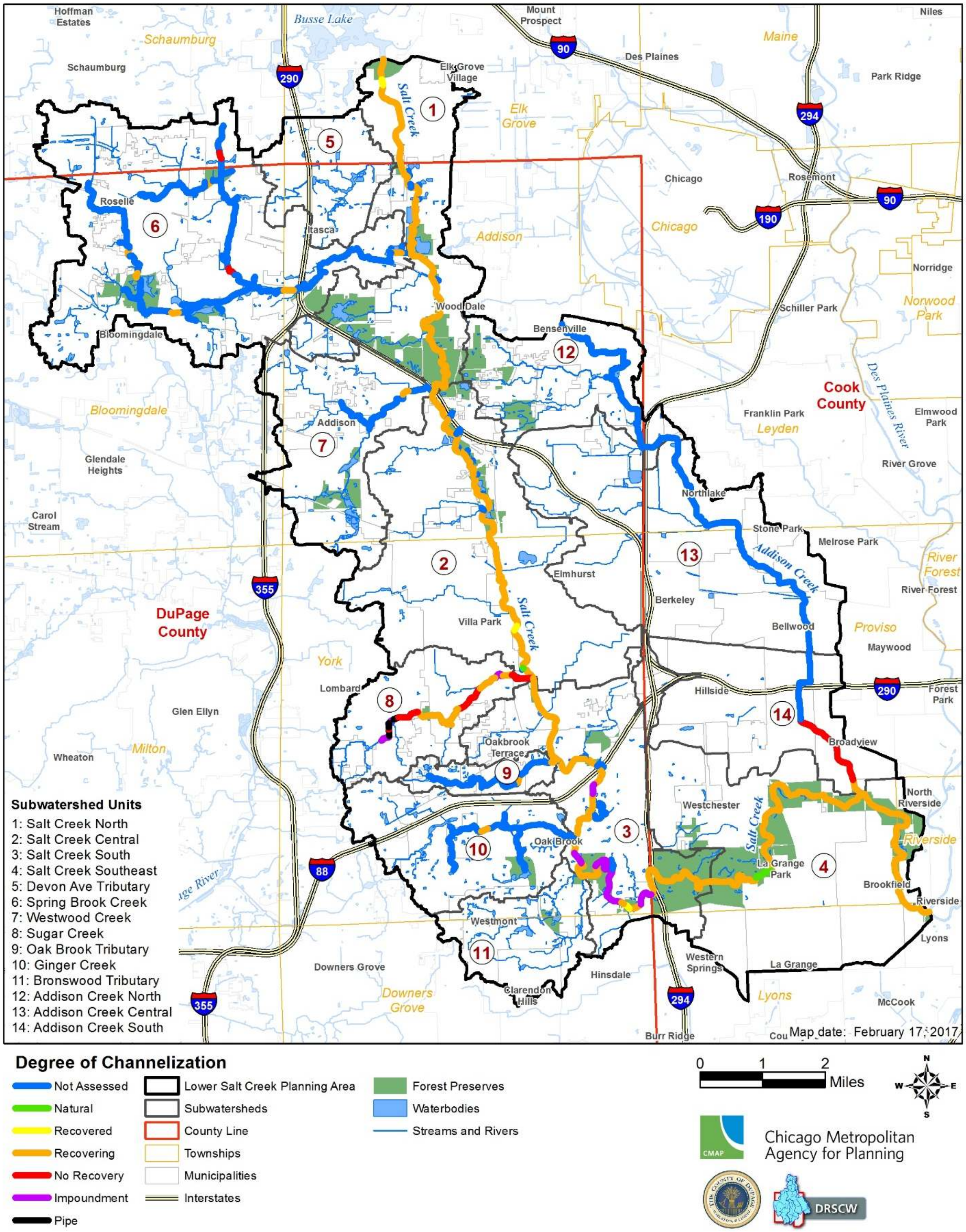
- **Natural** refers to no obvious direct no obvious direct moving or alteration of the channel and a natural appearance.
- **Recovered** refers to streams that have been channelized in the past, but which have recovered most of their natural channel characteristics.
- **Recovering** refers to channelized streams which are still in the process of regaining their former, natural however, these habitats are still degraded.
- **No Recovery** refers to streams that were recently channelized or those that show no significant recovery of habitats (e.g. drainage ditches, grass lined or rock riprap banks, etc.).
- **Impoundment** refers to the presences of impoundments and not a free flowing channel.

As expected with urban stream corridors, 100% of the stream miles assessed were historically channelized. Of the assessed streams, less than 1% have recovered from the channelization and natural channel characteristics were observed. The majority of the stream in the Lower Salt Creek watershed (84%) were significantly impacted by the channelization and showed limited signs of habitat recovery. Table 21 provides a summary of and Figure 24 illustrates the degree of channelization of the assessed reaches in the Lower Salt Creek Watershed.

Table 21. Degree of channelization for assessed stream reaches in the Lower Salt Creek planning area.

Degree of Channeli-zation	Salt Creek			Addison Creek			Salt Creek Tributaries			Totals		
	# of Reaches	Miles	% of Miles	# of Reaches	Miles	% of Miles	# of Reaches	Miles	% of Miles	# of Reaches	Miles	% of Miles
Natural	0	0	0%	0	0	0%	0	0	0%	0	0	0%
Recovered	3	0.3	1.0%	0	0	0%	0	0	0%	3	0.3	0.8%
Recovering	131	28.11	91.4%	2	0.28	15%	21	2.73	58.5%	154	31.1	84.1%
No Recovery	1	0.3	1.0%	6	1.4	85%	13	1.52	32.5%	20	3.2	8.6%
Impound-ments	13	2.02	6.6%	0	0	0%	8	0.42	9.0%	21	2.4	6.5%

Figure 24. Degree of channelization of assessed stream reaches in the Lower Salt Creek planning area.



3.5.2.4 Streambank Erosion

Streambank erosion is a function of the amount of water flowing along the bank, steepness of the bank, and vegetative cover or armoring on the bank. Streambank erosion is a natural process and contributes to the sinuous, meandering form often associated with natural stream channels. In these relatively natural systems, there is typically an overall balance between the amount of material eroded from one streambank and the amount of sediment deposited on another. However, in watersheds with significant development, streambank erosion rates are often increased by changes in watershed hydrology, leading to several problems. Erosion can cause physical water quality problems such as increased or excessive turbidity in the water. Erosion can also lead to sedimentation, which is the deposition of sediment within the stream channel. Sedimentation reduces the volume that can be conveyed and covering streambed materials such as gravel, which are important habitat for macroinvertebrates and fish. Additionally, erosion can lead to water quality problems because nutrients, phosphorus in particular, are often bound to sediment particles and introduced to the aquatic environment by erosion. Excessive erosion can also be problematic for property owners and land managers because it can lead to the loss of land, property, or structures.

As part of the physical stream condition survey prepared as part of the watershed-based planning the process, streambank erosion in the Lower Salt Creek watershed was documented. The degree of channelization was assessed using the following classifications:

- **None/Little** - streambanks are stable, but slightly changed along the transect line; less than 25% of streambank is receiving any stress, broken down, or eroding.

- **Moderate**-streambanks are receiving moderate alteration along transect line; at least 50% of streambank is in natural stable condition; not more than 50% is broken down or eroding.

- **Heavy**-streambanks have received major alterations along transect lines; less than 50% of streambank is in stable condition; over 50% of streambank is broken down or eroding.

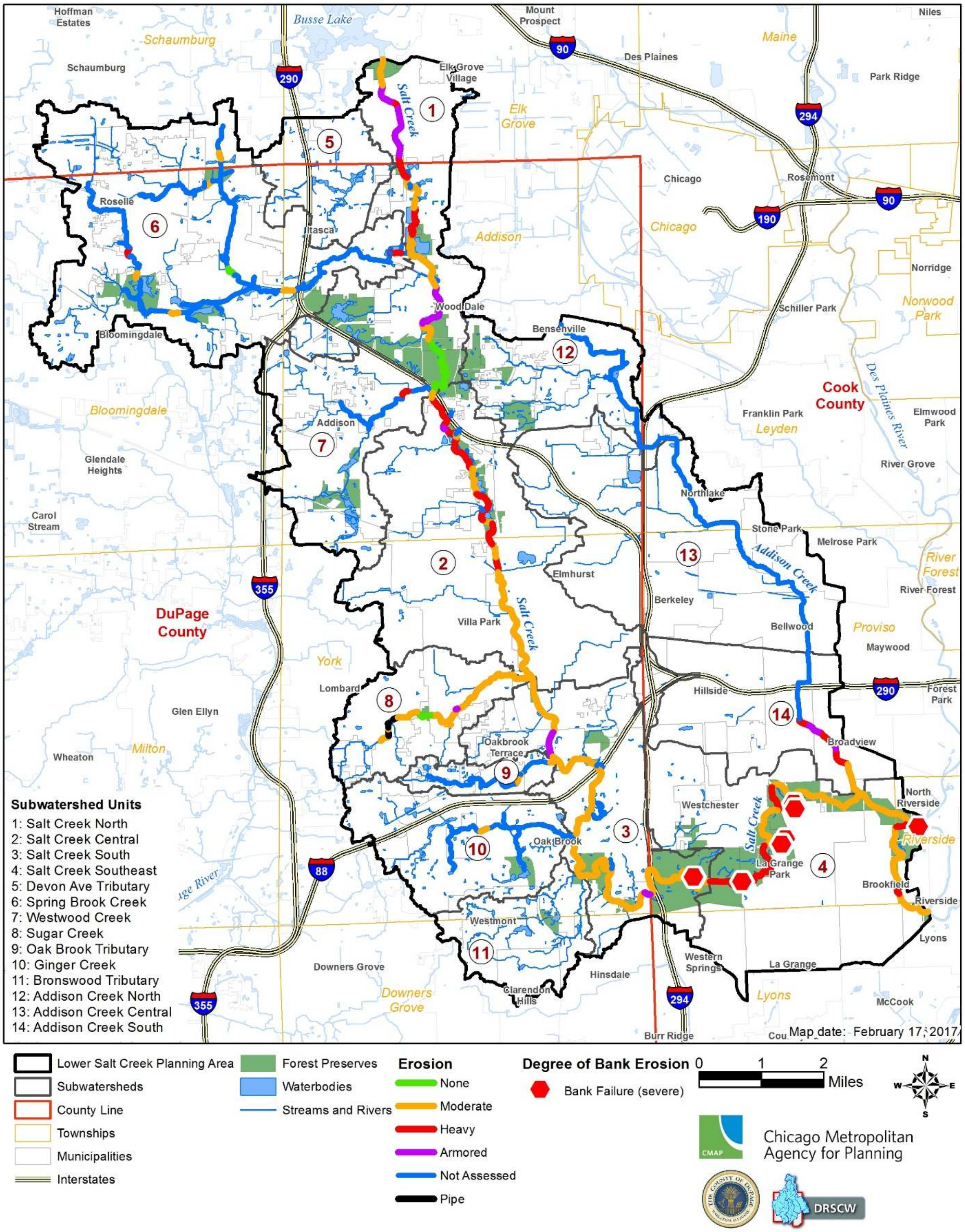
- **Armored** – streambanks have been treated with a-jacks, riprap, sheet piling, or other hard armoring.

Similar to other urban stream corridors, streambank erosion is prevalent throughput the Lower Salt Creek watershed. Of the assessed streams, 64% were found to have moderate erosion with 23% with heavy erosion. Additionally, 8% of the streams have been armored with a structural erosion control measure such as a-jacks, riprap, sheet piling, or concrete. Table 22 provides a summary of and Figure 25 illustrates the degree of streambank erosion of the assessed reaches in the Lower Salt Creek Watershed. In addition to field data collected in summer 2016 and winter 2017, which assessed the general condition of the streambanks, the 2010 Salt Creek Stream Assessment for TMDL watersheds identified specific locations of significant bank failure and areas of heavy erosion, also denoted on Figure 25.

Table 22. Degree of streambank erosion for assessed stream reaches in the Lower Salt Creek planning area.

Degree of Streambank Erosion	Salt Creek			Addison Creek			Salt Creek Tributaries			Totals		
	# of Reaches	Miles	% of Miles	# of Reaches	Miles	% of Miles	# of Reaches	Miles	% of Miles	# of Reaches	Miles	% of Miles
None/ Little	3	1.3	4.4%	0	0	0%	4	0.5	10.5%	7	1.8	5%
Moderate	100	19.5	63.3%	3	0.5	31.5%	34	3.7	79.4%	137	23.7	64%
Heavy	33	7.2	23.4%	3	0.8	48.3%	3	0.4	9.4%	39	8.4	23%
Armored	12	2.7	8.9%	2	0.3	20.2%	1	0.03	0.7%	15	3.1	8%

Figure 25. Degree of streambank erosion and locations of severe erosion along assessed reaches in the Lower Salt Creek planning area.



3.5.2.5 Riparian Buffers

Riparian buffers are the vegetated areas near a stream. Riparian buffers are comprised of grasses, grass-like, forbs, shrubs, trees or other vegetation growing along streams. Vegetated riparian buffers are important to stream health because they make streambanks more resistant to erosion, act as filters for runoff and pollutants, provide shade to the stream, offer habitat for wildlife and can be important links in the watershed green infrastructure network.

The width and quality of vegetated riparian buffers of the Lower Salt Creek watershed were visually assessed during the inventory and validated with high-resolution aerial photography of the watershed. For the purposes of the watershed-based plan, the riparian buffer width of the left bank and right bank (looking downstream) for each assessed reach were averaged assessed using the following classifications:

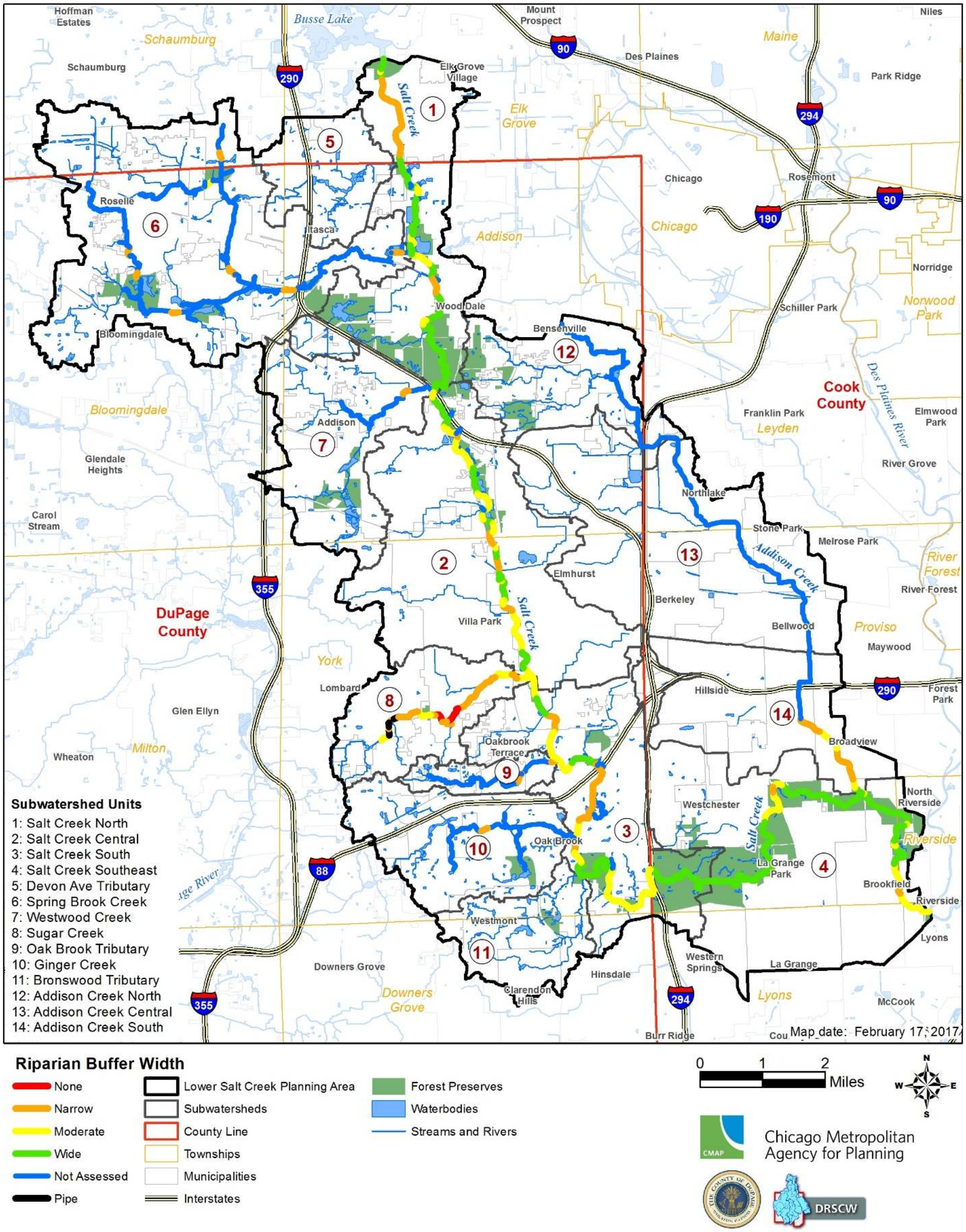
- **None** – 0 to 5 feet
- **Narrow** – 5 to 30 feet
- **Moderate** – 30 to 150 feet
- **Wide** – greater than 150 feet

Unlike what is typically expected from urban stream systems, the majority of the assessed streams were found to have a wide (greater than 150 feet) buffer. The wide buffer is directly associated with the Forest Preserves of Cook County (FPCC) and Forest Preserve District of DuPage County (FPDDC) acquisition of numerous parcels along the main stem and tributaries of Salt Creek for the Salt Creek Greenway Trail system. Table 23 provides a summary of and Figure 26 illustrates the average riparian buffer width of the assessed reaches in the Lower Salt Creek Watershed.

Table 23. Average riparian buffer width in the Lower Salt Creek planning area.

Avg. Width of Riparian Buffer	Salt Creek			Addison Creek			Salt Creek Tributaries			Totals		
	# of Reaches	Miles	% of Miles	# of Reaches	Miles	% of Miles	# of Reaches	Miles	% of Miles	# of Reaches	Miles	% of Miles
None	0	0	0%	0	0	0%	3	0.5	11%	3	0.5	1%
Narrow	34	4.7	15%	4	1.0	60%	29	3.0	65%	67	8.7	24%
Moderate	57	9.2	30%	3	0.5	32%	10	1.1	24%	70	10.8	29%
Wide	57	16.8	55%	1	0.2	8%	0	0	0%	58	17.0	46%

Figure 26. Average riparian buffer width along assessed stream reaches in the Lower Salt Creek planning area.



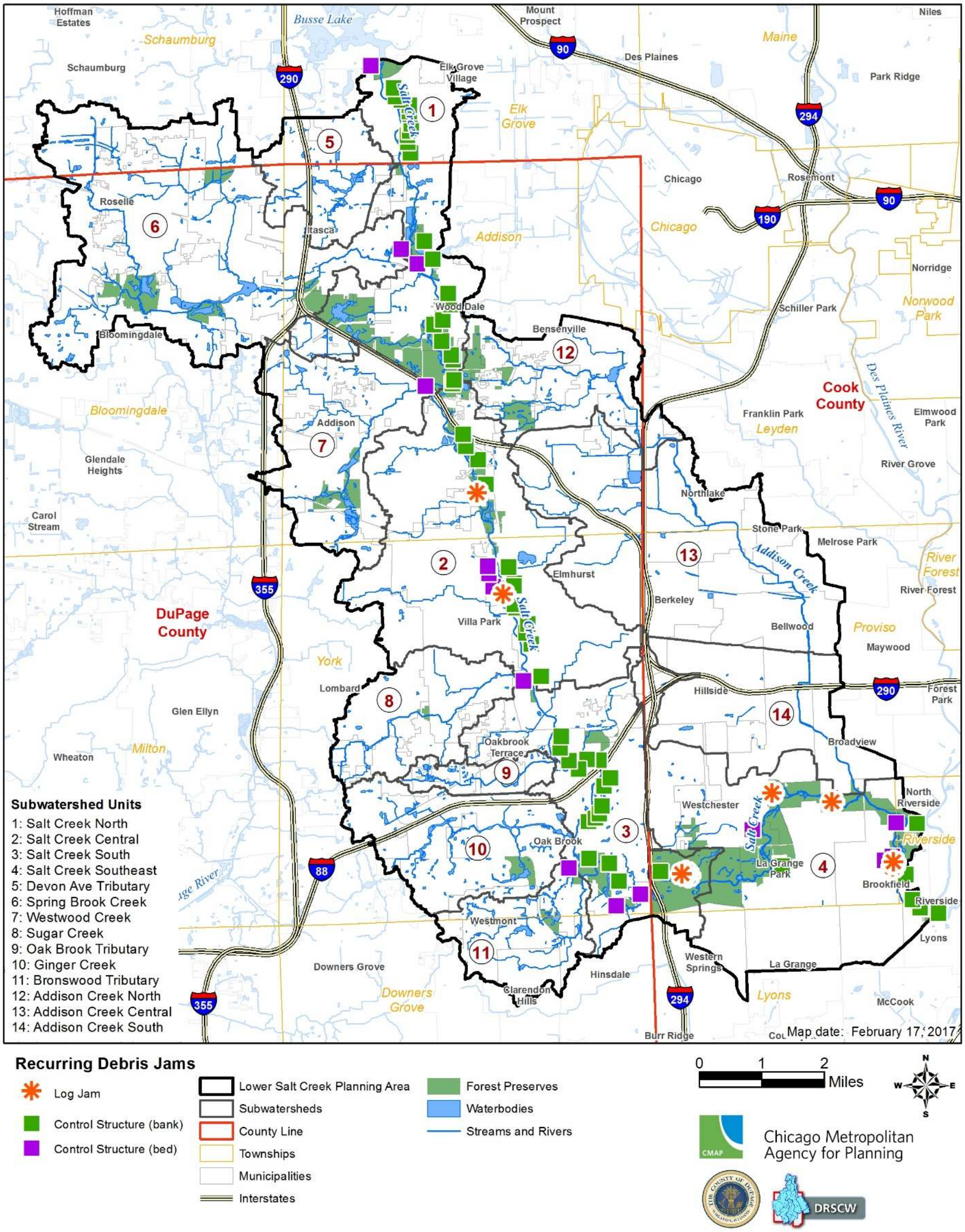
3.5.2.6 Debris Jams

Most streams transport some amount of debris such as tree limbs, brush, and leaves. Because debris transport is a naturally occurring stream process, some debris can provide habitat and contribute to a diverse instream environment. However, too much debris can be problematic and may result in large debris jams, causing backwater flooding and sediment deposition. Debris jams can also cause erosion of the stream banks that can lead to damage of riparian lands and property.

The 2010 Salt Creek Stream Assessment for TMDL watersheds identified specific locations of debris jams. These areas were confirmed and supplemented with data obtained from the 2016 and 2017 field assessment. In total, nine large debris jams were observed on the Salt Creek main stem.

Three of the debris jams were located at bridges or near structures and should be cleared to prevent upstream flooding at South 25th Avenue in Twenty-Six Street Woods Forest Preserve, just west of US 12/45, and north of St. Charles Road. The remaining debris jams were observed in forested areas and do not appear to be affecting water levels of adjacent properties. As such, it would be up to the landowner to determine if the debris jam is a problem and should be removed. Figure 27 denotes the locations of the observed debris jams in the Lower Salt Creek Watershed.

Figure 27. Locations of recurring debris jams in the main stem Salt Creek in the Lower Salt Creek planning area.



3.5.3 Stormwater Detention Basins

Stormwater detention is accomplished by way of a variety of means. Historic wetlands, ponds, and lakes are very often the recipients of stormwater that is expedited to such depressional areas via culverts and other traditional gray infrastructure. Of these, some have no natural outlet while others spill downhill or are evacuated via a lift station. Some wetlands may not have direct stormwater inputs but receive overland flow from other waterbodies that receive piped stormwater. Other detention basins are purposefully built in conjunction with newer developments. Of this last type, some basins are normally dry (i.e., dry bottom) and others retain water year round (i.e., wet bottom) unless designed as infiltration basins.

In an attempt to create a comprehensive inventory of detention basins throughout the Lower Salt Creek Watershed, DuPage County Stormwater Management (DCSM) and CMAP staff identified basins throughout the study area using GIS data, aerial maps, permit records, and field visits. Following basin identification, DCSM and municipal partner staff physically assessed each of them within the DuPage County portion of the planning area, compiling the data into an ESRI ArcGIS Collector Application created by DCSM. The app was based on a "rapid assessment" form provided by CMAP which in turn was based on protocols developed by the Lake County Stormwater Management Commission (LCSMC). CMAP and municipal partner staff conducted assessments of those basins within the Cook County portion of the planning area, utilizing either the DCSM app or paper field forms. The following aspects of each detention basin were assessed:

- Type of basin (wet, wet with extended dry detention, dry turf, dry naturalized, constructed wetland)
- On-stream (yes/no, stream name)
- Connected to Other Basins (yes/no, upstream/downstream)
- Side Slope Cover types (turf grass, native plants, invasive plants, rip rap, seawall)
- Side Slope Angle (horizontal : vertical)
- Buffer Width (native plants)
- Water's Edge Cover types (not applicable, turf grass, native/wetland plants, invasive plants, rip rap)
- Basin Bottom Cover types (unknown, turf grass, native/wetland plants, submersed aquatic vegetation, invasive plants, concrete-lined channel)
- Shoreline Erosion (not applicable, minimal, slight, moderate, high)
- Safety Shelf presence (yes/no/unknown) and Wetland Vegetation presence (yes/no)
- Sediment Forebay presence (yes/no/unknown)
- Stilling Basin presence at Inlets and Outlets (yes/no/unknown)
- Short Circuiting (yes/no)
- Overall Water Quality Benefits Assessment (good, fair, poor)
- Management needs
- Retrofit opportunities within the basin and immediate contributing area

The types of basins found in the Lower Salt Creek Watershed include dry naturalized, dry turf, wet, wet with extended dry, and constructed wetland. When in good condition, these basins play an important water quality role by retaining stormwater runoff and filtering pollutants before slowly releasing the runoff.

The number, location, type[40], and relative water quality benefit of detention basins were determined for this plan. All things considered, the planning area appears to have at least 708 engineered features of the landscape that serve a stormwater detention role (Table 24, Figure 31). Unless something unique or unusual was obvious, the assessment of overall water quality benefits – good, fair, poor – is largely a function of detention basin type. Retrofitting opportunities and management needs were also noted (Appendix x).

Table 24. Summary of stormwater detention basins in DuPage County portion of Lower Salt Creek planning area, by political jurisdiction.

By Political Jurisdiction	*No. Basins ID'd*	*Detention Basin Type*						*WQ Benefit*			*Unas-sessed*
		Wet	*Dry-Turf*	*Dry-Nat.*	*Wet-Ext. Dry*	*Const. Wetlnd*	*Vol. Wetlnd*	*Good*	*Fair*	*Poor*	
Addison	68	34	23	3	7	1	---	16	7	45	---
Bensenville	9	8	0	1	0	0	---	0	5	4	---
Bloomingdale	65	36	22	3	0	4	---	12	10	43	---
Clarendon Hills	3	3	0	0	0	0	---	0	1	2	---
Elmhurst	40	17	9	7	0	5	---	6	14	19	1
Hinsdale	7	7	0	0	0	0	---	0	0	7	---
Itasca	76	60	7	4	1	4	---	13	30	33	---
Lombard	100	30	40	13	12	5	---	25	24	51	---
Oak Brook	126	122	1	1	2	0	---	0	29	97	---
Oakbrook Terrace	13	11	0	1	0	1	---	1	3	9	---
Roselle	9	9	0	0	0	0	---	1	4	4	---
Unincorp. DuPage Co.	80	56	13	7	1	3	---	10	30	40	---
Villa Park	57	12	30	10	2	3	---	6	16	35	---
Westmont	25	22	1	2	0	0	---	2	9	14	---
Wood Dale	30	8	18	2	2	0	---	2	4	24	---
Totals	**708**	**435**	**164**	**54**	**27**	**26**	---	**94**	**186**	**427**	**1**

Generally, basins providing "good" water quality benefits were either a) wet detention with a vegetated wetland shelf, native plant side slopes, and submersed aquatic vegetation, b) constructed wetlands, or c) dry detention with native vegetation throughout the basin bottom

[40] Six types of detention basins are noted: 1) dry bottom – turf, 2) dry bottom –naturalized, 3) wet bottom, 4) wet bottom with an extended dry area, 5) constructed wetland, and 6) "volunteer" wetland.

and side slopes (Figure 28). Basins providing "fair" water quality benefits were generally either a) wet detention with a vegetated wetland shelf, turf grass side slopes, and possibly submersed aquatic vegetation, or b) dry detention containing a native vegetation waterway or bioswale, or a native vegetation pre-outlet area (Figure 29). Basins providing "poor" water quality benefits were typically either a) wet detention with turfgrass side slopes, no or minimum vegetated wetland shelf, and possibly short-circuiting, or b) dry detention with turfgrass bottom, possibly a concrete-lined channel, and/or possibly short circuiting (Figure 30).

Table 25. Summary of stormwater detention basins in DuPage County portion of Lower Salt Creek planning area, by subwatershed.

Subwatershed		*No. Basins ID'd*	*Detention Basin Type*						*WQ Benefit*			*Unas-sessed*
#	*Name*		*Wet*	*Dry-Turf*	*Dry-Nat.*	*Wet-Ext. Dry*	*Const. Wetlnd*	*Vol. Wetlnd*	*Good*	*Fair*	*Poor*	
1	Salt Crk North	43	19	16	5	2	1	---	6	13	24	---
2	Salt Crk Cntrl	72	22	32	7	2	8	---	11	23	37	1
3	Salt Crk South	76	56	7	8	1	3	---	4	16	56	---
4	Salt Crk Southeast	*	*	*	*	*	*	*	*	*	*	*
5	Devon Ave Trib	36	32	0	1	0	3	---	3	17	16	---
6	Spring Brook Crk	126	82	32	6	1	5	---	25	30	71	---
7	Westwood Crk	78	26	32	10	7	3	---	20	13	45	---
8	Sugar Crk	62	17	26	9	10	0	---	13	16	33	---
9	Oak Brook Trib	21	20	0	0	0	1	---	1	5	15	---
10	Ginger Crk	114	99	10	1	3	1	---	5	35	74	---
11	Bronswood Trib	30	26	2	2	0	0	---	2	6	22	---
12	Addison Crk North	34	27	4	1	1	1	---	2	7	25	---
13	Addison Crk Cntrl	16	9	3	4	0	0	---	2	5	9	---
14	Addison Crk South	*	*	*	*	*	*	*	*	*	*	*
	Totals	**708**	**435**	**164**	**54**	**27**	**26**		**94**	**186**	**427**	**1**

* These subwatersheds lie entirely within Cook County.

Figure 28. Examples of detention basins providing "good" water quality benefits.

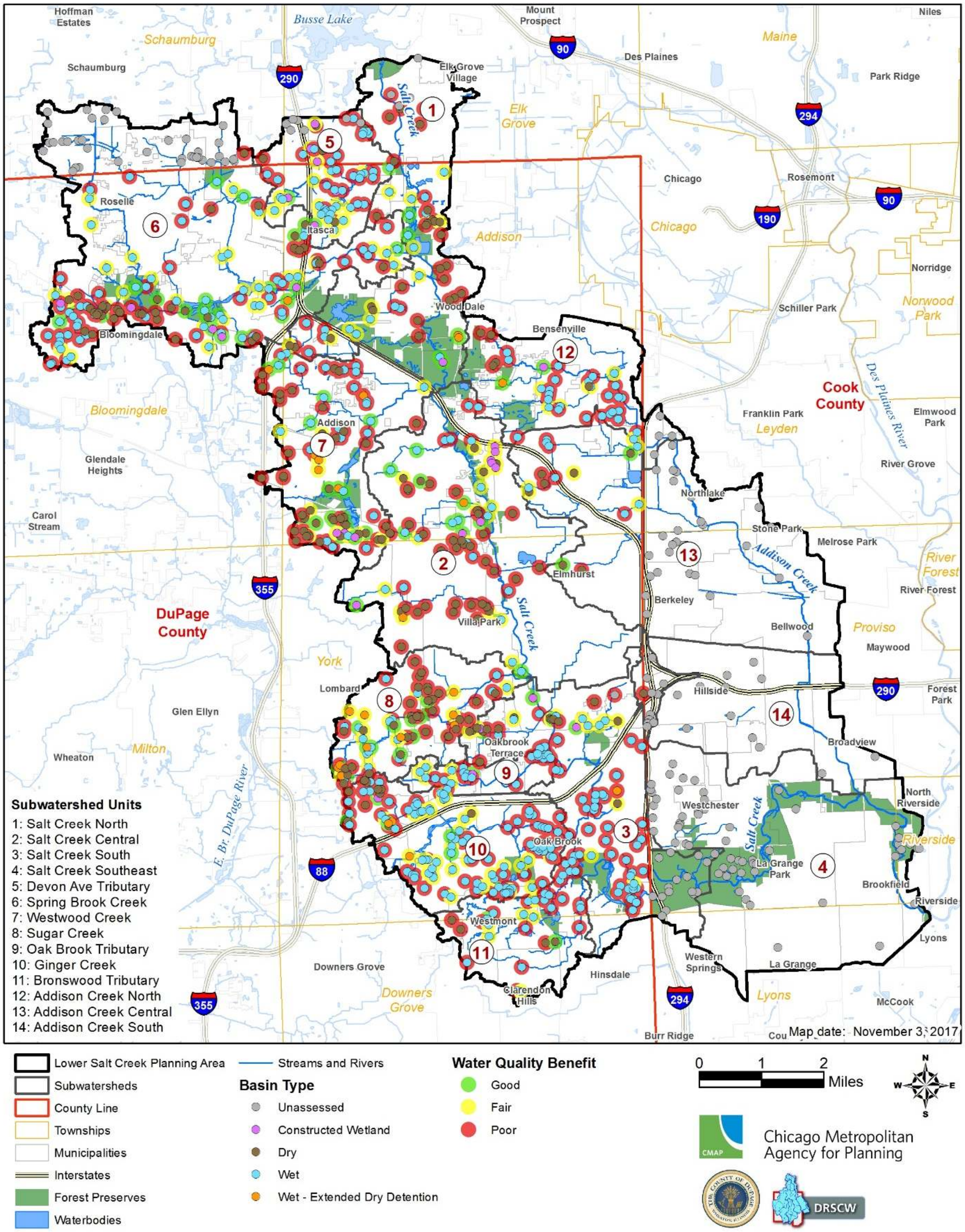
Springfield Park - Bloomingdale	Lake Street - unincorporated

Figure 29. Examples of detention basins providing "fair" water quality benefits.

Lake Street - unincorporated Rose Drive - Bloomingdate

Figure 30. Examples of detention basins providing "poor" water quality benefits.

Figure 31. Stormwater detention basins in Lower Salt Creek planning area.



3.5.3 Groundwater Studies

No comprehensive groundwater studies have been conducted for the Lower Salt Creek Watershed within the last 30 years. This research gap is due largely to the transition to Lake Michigan water for residential needs and has been identified as a critical action area in recent plans.

The first water study conducted in the region was the 1962 Ground-Water Resources of DuPage County, Illinois report. This report focused primarily on groundwater quantity and found that the county's four groundwater sources – glacial drift aquifers, the Silurian dolomite aquifer, the Cambrian-Ordovician aquifer, and the Mt. Simon aquifer – were being rapidly depleted, with the potential to overshoot sustainable withdraw levels as early as 1977.[41] A follow-up 1986 report, Public Ground-Water Supplies in DuPage County, found that groundwater depletion was a continued problem, leading to an average annual drawdown of 12 feet per year. The report also included more information about water quality. Of the 65 public wells studied, one was found to exceed safe chloride levels and five wells were found to contain traces of sulfide gas.[42]

Between late 2000 and early 2002, a study initiated by the Illinois EPA of residential wells in the neighboring communities of Lisle and Downers Grove, located southwest of the planning area, found unsafe levels of trichloroethylene (TCE) and tetrachloroethylene (PCE) in 900 private wells. Immediately following the release of this study, the Illinois Department of Public Health launched an investigation into the potential for TCE/PCE-related cancer occurrence but concluded that there was no link between the contamination and local caner rates.[43]

Due to these concerns, groundwater has largely been phased out for residential use within the Lower Salt Creek Planning area (Figure 32). With the exception of Western Springs,[44] residents in the planning area receive their drinking water from Lake Michigan, via the City of Chicago (see Section 3.7.5 Community Water Supply Wells, Setbacks, and Groundwater Restricted Use Areas). DuPage County made this switch in the 1990s, while municipalities northern and east of the County's border made the switch in the 1980s and as early as the 1970s, respectively.[45] This transition has enabled the region to continue growing, despite water concerns, and has greatly reduced the amount of resources dedicated to monitoring groundwater quality and quantity.

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[41] Zeizel, Arthur J., William C. Walton, Robert T. Sasman, and Thomas A. Prickett. 1962. Ground-Water Resources of DuPage County, Illinois. Illinois State Water Survey & Illinois State Geological Survey. http://www.isws.illinois.edu/pubdoc/coop/iswscoop-2.pdf

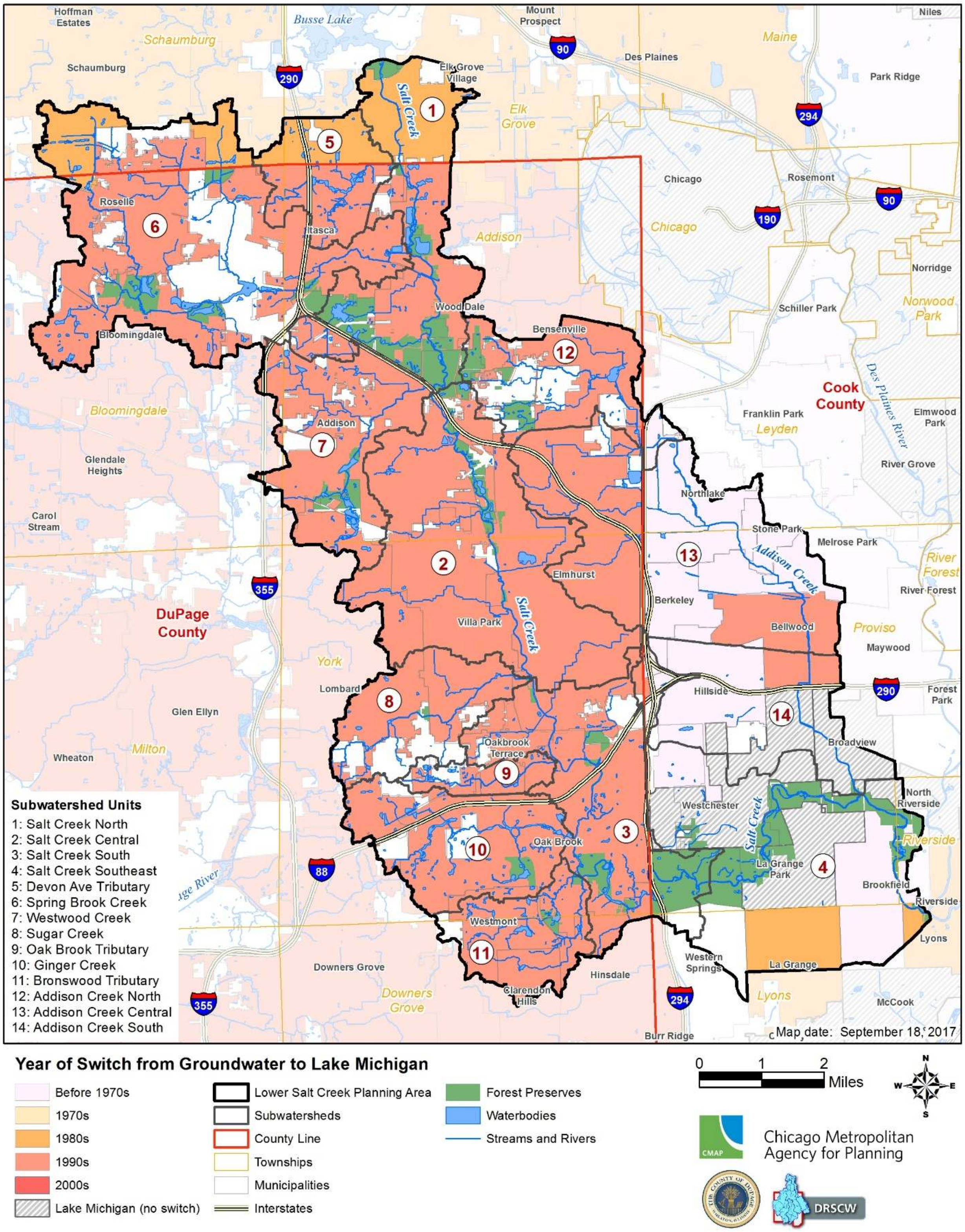
[42] Woller, Dorothy M., Ellis W. Sanderson, and Michael L. Sargent. 1986. Public Ground-Water Supplies in DuPage County. Illinois State Water Survey. http://www.isws.illinois.edu/pubdoc/B/ISWSB-60-32.pdf

[43]Qiao B, Evans L, Shen T. 2005. Examining Potential Relationships between Cancer Incidence and Ground Water Contamination with Trichloroethylene (TCE) and Tetrachloroethylene (PCE) in Lisle and Downers Grove. Epidemiologic Report Series 05:02. Springfield, IL: Illinois Department of Public Health.

[44] In the past Western Springs had been granted a Lake water allocation, however, the overall costs were not seen as a viable option for the Village.

[45] Westchester, North Riverside, La Grange Park, and Broadview are four municipalities intersecting the Lower Salt Creek watershed planning area that have always received their drinking water from Lake Michigan.

Figure 32. Shift to Lake Michigan drinking water by decade.



3.5.3.1 Sensitive Aquifer Recharges Areas

Despite this transition from groundwater, the 1989 DuPage County Stormwater Management Plan recognizes the importance of maintaining a healthy aquifer and requires watershed plans to identify remedial measures to protect wetlands, riparian zones, and sensitive recharge areas.[46] In northeastern Illinois, county-focused mapping of shallow aquifer susceptibility to contamination has been conducted for McHenry[47] and Kane[48] Counties to date. The Illinois State Geological Survey has completed 3-D hydrogeologic mapping in Lake County, has the beginnings of a 3-D map for Kendall County, and is in year two of a three year project to do so in Will County, and from this data an aquifer sensitivity map can be generated. At the current level of manpower and funding, it is anticipated that 3-D hydrogeologic mapping could be completed in 2020 for DuPage County and by 2025 for Cook County.[49]

3.5.5 Surface Water Quality

3.5.5.1 Designated Uses, Assessment and Impairment Status

The Illinois Integrated Water Quality Report (Integrated Report) and Section 303(d) List [303(d) List] comprise a major source of information available for assessing stream health and identifying sources of impairment on the part of watershed planning initiatives statewide. These documents are released every two years by the Illinois Environmental Protection Agency (Illinois EPA), with the most recent Integrated Report issued in 2016. The purpose of the Integrated Report is to provide water quality data for both surface and ground waters and to fulfill Section 303(d) of the federal Clean Water Act and the Water Quality Planning and Management regulation at 40 CFR Part 130 for the State of Illinois.[50]

This watershed plan focuses on the surface water data as it relates to waterbodies within the Lower Salt Creek planning area. The Integrated Report seeks to assess the extent to which waterbodies support a set of recognized designated uses. Each designated use has a related standard for which the designated use for that stream or lake is protected. Illinois EPA has seven possible designated uses; however, only five of those uses apply within the Lower Salt Creek planning area. These are Aquatic Life, Fish Consumption, Primary Contact, Secondary Contact, and Aesthetic Quality. A waterbody is considered not fully supporting of a designated use if it does not meet the related standard. These standards are derived from several types of

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[46] DuPage County Department of Stormwater Management. 1989. DuPage County Stormwater Management Plan. http://www.dupageco.org/EDP/Stormwater_Management/1163/

[47] McHenry Co. GIS Dept. 2008. McHenry County Sensitive Aquifer Recharge Areas. https://www.co.mchenry.il.us/home/showdocument?id=8212 (accessed Feb. 14, 2017).

[48] Dey, W.S., A.M. Davis, and B.B. Curry. 2007. Aquifer Sensitivity to Contamination, Kane County, Illinois. Illinois State Geological Survey. http://www.isgs.illinois.edu/sites/isgs/files/maps/county-maps/kane-as.pdf (accessed Feb. 14, 2017).

[49] Brandon Curry, ISGS. Personal e-mail correspondence to CMAP staff. Dec. 10, 2015.

[50] IEPA. 2016. "Illinois Integrated Water Quality Report and Section 303(d) List." Available at: http://www.epa.state.il.us/water/tmdl/303d-list.html.

information including biological data, water chemistry, instream habitat, and toxicity data. Table 26 shows the three tier rating system associated with each standard.

Table 26. Levels of designated use attainment.

Level of Use Support	*General Resource Quality*	*Relationship to Water Quality Standard*	*Impaired? (on 303(d) List)*
Fully Supporting	Good	Meets Standard	No
Not Supporting	Fair	Does not meet standard	Yes
Not Supporting	Poor	Does not meet standard	Yes

Waters found to be not fully supporting of any of the seven designated uses as an outcome of an assessment are said to be impaired and placed on the 303(d) List. Removing waterbodies from the 303(d) List is a main objective of watershed planning projects like the Lower Salt Creek Watershed-Based Plan.

Numerous waterbodies (stream segments and lakes) in the Lower Salt Creek planning area have been assessed for water quality impairments (Figure 33). The following tables (Table 27 through Table 34) summarize the designated uses, assessment status, impairment status, and causes and sources of impairment for waterbodies within the Lower Salt Creek planning area as identified in the Integrated Report for 2016.[51]

Table 27. Specific assessment information for streams, 2016.

AUID	Stream Name	Miles	Use Attainment	Causes	Sources
IL_GLBA	Meacham Creek	2.49	N582, X583, X585, X586, X590	319, 322	58, 177
IL_GL-10	Salt Creek	3.71	N582, N583, N585, X586, F590	84, 96, 138, 246, 277, 301, 319, 322, 441, 274, 348, 400	20, 125, 28, 85, 177, 58, 132, 142, 140, 10
IL_GLB-01	Spring Brook	3.14	N582, X583, X585, X586, X590	84, 177, 213, 246, 319, 322, 371, 403, 462, 479	20, 28, 58, 85, 132, 177
IL_GLB-07	Spring Brook	4.19	N582, X583, X585, X586, X590	463	140
IL_GL-03	Salt Creek	10.52	N582, N583, X585, X586, X590	84, 177, 244, 322, 348, 371, 403, 462, 500, 274	20, 84, 28, 23, 115, 122, 177, 85, 142, 10, 140
IL_GL-09	Salt Creek	12.21	N582, N583, N585, X586, F590	79, 138, 277, 319, 322, 371, 403, 462, 274, 348, 400	28, 23, 85, 177, 58, 132, 142, 10, 140
IL_GL-19	Salt Creek	3.15	N582, N583, N585, X586, X590	84, 138, 319, 403, 462, 274, 348, 400	20, 23, 85, 177, 10, 140

[51] http://www.epa.illinois.gov/topics/water-quality/watershed-management/tmdls/303d-list/index

IL_GLA-02	Addison Creek	6.71	N582, X583, N585, X586, N590	79, 84, 138, 154, 177, 246, 301, 319, 462, 500, 400, 181	28, 20, 72, 23, 85, 177, 132, 142, 84
IL_GLA-04	Addison Creek	3.44	N582, X583, X585, X586, N590	1, 84, 163, 246, 319, 322, 348, 371, 403, 462, 471, 479, 519	28, 20, 72, 125, 132, 85, 58, 177, 142

Table 28. Specific assessment information for lakes, 2016.

AUID	Lake Name	Acres	Use Attainment	Causes	Sources
IL_WGZQ	SONGBIRD (formerly BLACKBIRD)	15.0	X582, X583, X585, X586, X590	N/A	N/A
IL_RGZH	Lake Kadijah	25.9	X582, X583, X585, X586, X590	N/A	N/A
IL_RGN	Briarwood Central	25.0	I582, X583, X585, X586, I590	371, 478, 463	71, 122, 177, 28
IL_RGR	CHARLES	15.0	I582, X583, X585, X586, I590	462, 479	140
IL_WGZG	GROVE	8.0	I582, X583, X585, X586, I590	N/A	N/A
IL_WGZY	SWAN (formerly INDIAN)	4.0	F582, X583, X585, X586, N590	462, 479	134, 181

Table 29. Use support information for streams, 2016.

Designated Use	Stream Miles Fully Supporting (F)	Stream Miles Not Supporting (N)	Stream Miles Insufficient Information (I)	Stream Miles Not Assessed (X)
Aquatic Life (582)	-	49.56	-	-
Fish Consumption (583)	-	29.59	-	19.97
Primary Contact (585)	-	25.78	-	23.78
Secondary Contact (586)	-	-	-	49.56
Aesthetic Quality (590)	15.92	10.15	-	23.49
Total Stream Miles: 49.56				

Table 30. Use support information for lakes, 2016.

Designated Use	Lake Acres Fully Supporting (F)	Lake Acres Not Supporting (N)	Lake Acres Insufficient Information (I)	Lake Acres Not Assessed (X)
Aquatic Life (582)	4.0	-	48.0	40.9
Fish Consumption (583)	-	-	-	92.9
Primary Contact (585)	-	-	-	92.9
Secondary Contact (586)	-	-	-	92.9
Aesthetic Quality (590)	-	4.0	48.0	40.9
Total Lake Acres: 92.9				

Figure 33. Illinois EPA monitoring stations and waterbody impairment status in the Lower Salt Creek planning area.

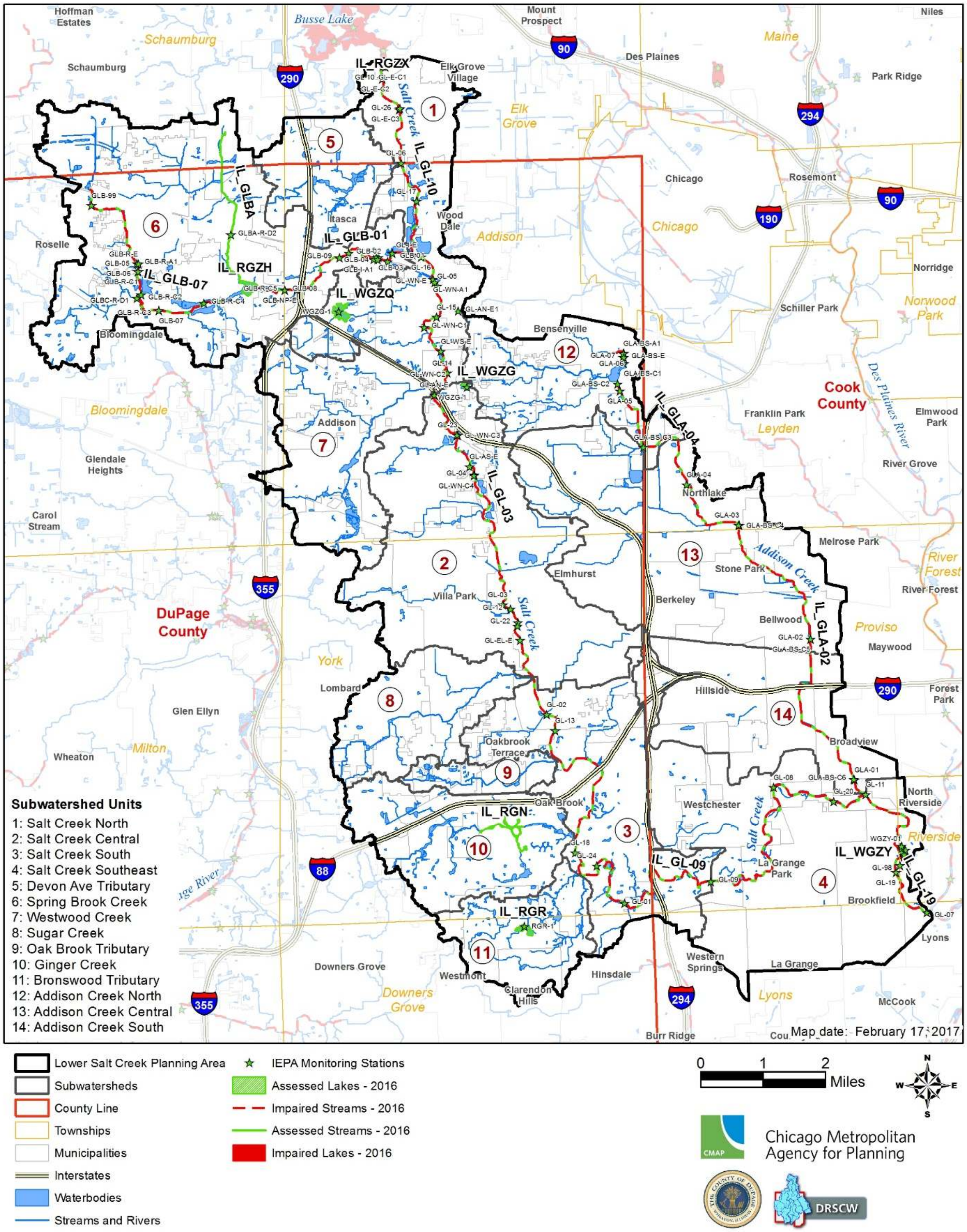


Table 31. Causes of impairments for streams, 2016.

Cause ID	Cause Of Impairment	305(b) Stream Miles Impaired	Percentage of Total 305(b) Stream Miles (49.56)
462	Phosphorus (Total)	39.17	79.04
322	Oxygen, Dissolved	35.51	71.65
319	Other flow regime alterations	34.85	70.32
348	Polychlorinated biphenyls	33.03	66.65
403	Total Suspended Solids (TSS)	32.46	65.50
274	Mercury	29.59	59.71
371	Sedimentation/Siltation	29.31	59.14
138	Chloride	25.78	52.02
400	Fecal Coliform	25.78	52.02
84	Alteration in stream-side or littoral vegetative covers	23.96	48.35
177	DDT	20.37	41.10
79	Aldrin	18.92	38.18
500	Changes in Stream Depth and Velocity Patterns	17.23	34.77
246	Hexachlorobenzene	17.00	34.30
277	Methoxychlor	15.92	32.12
244	Heptachlor	10.52	21.23
301	Nickel	10.42	21.03
154	Chromium (total)	6.71	13.54
181	Debris/Floatables/Trash	6.71	13.54
479	Aquatic Algae	6.58	13.28
463	Cause Unknown	4.19	8.45
96	Arsenic	3.71	7.49
441	pH	3.71	7.49
1	.alpha.-BHC	3.44	6.94
163	Copper	3.44	6.94
471	Bottom Deposits	3.44	6.94
519	Visible Oil	3.44	6.94
213	Endrin	3.14	6.34
	Total Stream Miles: 49.56		

Table 32. Causes of impairment for lakes, 2016.

Cause ID	Cause Of Impairment	305(b) Lake Acres Impaired	Percentage of Total 305(b) Lake Acres (92.9)
371	Sedimentation/Siltation	25.0	26.9
463	Cause Unknown	25.0	26.9
478	Aquatic Plants (Macrophytes)	25.0	26.9
462	Phosphorus (Total)	19.0	20.5
479	Aquatic Algae	19.0	20.5
	Total Lake Acres: 92.9		

Table 33. Sources of impairment for streams, 2016.

Source ID	Source Of Impairment	305(b) Stream Miles Impaired	Percentage of Total 305b Stream Miles (49.56)
177	Urban Runoff/Storm Sewers	45.37	91.55
85	Municipal Point Source Discharges	42.88	86.52
28	Contaminated Sediments	39.73	80.17
142	Dam or Impoundment	36.59	73.83
140	Source Unknown	33.78	68.16
23	Combined Sewer Overflows	32.59	65.76
20	Channelization	30.67	61.88
10	Atmospheric Depositon – Toxics	29.59	59.71
132	Upstream Impoundments (e.g., Pl-566 NRCS Structures)	29.21	58.94
58	Impacts from Hydrostructure Flow Regulation/modification	24.99	50.42
84	Alteration in stream-side or littoral vegetative covers	17.23	34.77
115	Sanitary Sewer Overflows (Collection System Failures)	10.52	21.23
122	Site Clearance (Land Development or Redevelopment)	10.52	21.23
72	Loss of Riparian Habitat	10.15	20.48
125	Streambank Modifications/destablization	7.15	14.43
	Total Stream Miles: 49.56		

Table 34. Sources of impairment for lakes, 2016.

Source ID	Source Of Impairment	305(b) Lake Acres Impaired	Percentage of Total 305(b) Lake Acres (92.9)
28	Contaminated Sediments	25.0	26.9
71	Littoral/shore Area Modifications (Non-riverine)	25.0	26.9
122	Site Clearance (Land Development or Redevelopment)	25.0	26.9
177	Urban Runoff/Storm Sewers	25.0	26.9
140	Source Unknown	15.0	16.1
134	Waterfowl	4.0	4.3
181	Runoff from Forest/Grassland/Parkland	4.0	4.3
	Total Lake Acres: 92.9		

The following table summarizes the causes of impairment for stream segments and lakes within the Lower Salt Creek planning area as identified in the 303(d) list (Appendix A-2) of the 2016 Integrated Report.

Table 35. 303(d) list information for waterbodies in the Lower Salt Creek planning area.

Water Name	Assessment ID	Water Size*	Designated Use	Cause
Addison Creek	IL_GLA-02	6.71	Aesthetic Quality	Debris/Floatables/Trash
Addison Creek	IL_GLA-02	6.71	Aquatic Life	Aldrin
Addison Creek	IL_GLA-02	6.71	Aquatic Life	Chromium (total)
Addison Creek	IL_GLA-02	6.71	Aquatic Life	DDT
Addison Creek	IL_GLA-02	6.71	Aquatic Life	Hexachlorobenzene
Addison Creek	IL_GLA-02	6.71	Aquatic Life	Nickel
Addison Creek	IL_GLA-02	6.71	Aquatic Life	Phosphorus (Total)
Addison Creek	IL_GLA-02	6.71	Primary Contact Recreation	Fecal Coliform
Addison Creek	IL_GLA-04	3.44	Aesthetic Quality	Bottom Deposits
Addison Creek	IL_GLA-04	3.44	Aesthetic Quality	Phosphorus (Total)
Addison Creek	IL_GLA-04	3.44	Aesthetic Quality	Visible Oil
Addison Creek	IL_GLA-04	3.44	Aquatic Life	alpha-BHC
Addison Creek	IL_GLA-04	3.44	Aquatic Life	Copper
Addison Creek	IL_GLA-04	3.44	Aquatic Life	Hexachlorobenzene
Addison Creek	IL_GLA-04	3.44	Aquatic Life	Phosphorus (Total)
Addison Creek	IL_GLA-04	3.44	Aquatic Life	Polychlorinated biphenyls
Addison Creek	IL_GLA-04	3.44	Aquatic Life	Sedimentation/Siltation
Salt Creek	IL_GL-03	10.52	Aquatic Life	DDT
Salt Creek	IL_GL-03	10.52	Aquatic Life	Heptachlor
Salt Creek	IL_GL-03	10.52	Aquatic Life	Phosphorus (Total)

Salt Creek	IL_GL-03	10.52	Aquatic Life	Polychlorinated biphenyls
Salt Creek	IL_GL-03	10.52	Aquatic Life	Sedimentation/Siltation
Salt Creek	IL_GL-03	10.52	Fish Consumption	Mercury
Salt Creek	IL_GL-03	10.52	Fish Consumption	Polychlorinated biphenyls
Salt Creek	IL_GL-09	12.21	Aquatic Life	Aldrin
Salt Creek	IL_GL-09	12.21	Aquatic Life	Methoxychlor
Salt Creek	IL_GL-09	12.21	Aquatic Life	Phosphorus (Total)
Salt Creek	IL_GL-09	12.21	Aquatic Life	Sedimentation/Siltation
Salt Creek	IL_GL-09	12.21	Fish Consumption	Mercury
Salt Creek	IL_GL-09	12.21	Fish Consumption	Polychlorinated biphenyls
Salt Creek	IL_GL-09	12.21	Primary Contact Recreation	Fecal Coliform
Salt Creek	IL_GL-10	3.71	Aquatic Life	Arsenic
Salt Creek	IL_GL-10	3.71	Aquatic Life	Hexachlorobenzene
Salt Creek	IL_GL-10	3.71	Aquatic Life	Methoxychlor
Salt Creek	IL_GL-10	3.71	Aquatic Life	Nickel
Salt Creek	IL_GL-10	3.71	Aquatic Life	Oxygen, Dissolved
Salt Creek	IL_GL-10	3.71	Aquatic Life	pH
Salt Creek	IL_GL-10	3.71	Fish Consumption	Mercury
Salt Creek	IL_GL-10	3.71	Fish Consumption	Polychlorinated biphenyls
Salt Creek	IL_GL-10	3.71	Primary Contact Recreation	Fecal Coliform
Salt Creek	IL_GL-19	3.15	Aquatic Life	Phosphorus (Total)
Salt Creek	IL_GL-19	3.15	Fish Consumption	Mercury
Salt Creek	IL_GL-19	3.15	Fish Consumption	Polychlorinated biphenyls
Salt Creek	IL_GL-19	3.15	Primary Contact Recreation	Fecal Coliform
Spring Brook	IL_GLB-01	3.14	Aquatic Life	DDT
Spring Brook	IL_GLB-01	3.14	Aquatic Life	Endrin
Spring Brook	IL_GLB-01	3.14	Aquatic Life	Hexachlorobenzene
Spring Brook	IL_GLB-01	3.14	Aquatic Life	Phosphorus (Total)
Spring Brook	IL_GLB-01	3.14	Aquatic Life	Sedimentation/Siltation
Spring Brook	IL_GLB-07	4.19	Aquatic Life	Cause Unknown
SWAN (Indian Lk)	IL_WGZY	4.00	Aesthetic Quality	Phosphorus (Total)

The Clean Water requires that a Total Maximum Daily Load (TMDL) be developed for each pollutant of an impaired water body. The DuPage River/Salt Creek Watershed TMDL Stage 1 Report[52] was completed in October 2009. It addressed certain pollutants for Spring Brook (dissolved oxygen, fecal coliform), Salt Creek (fecal coliform, pH), and Addison Creek (fecal coliform). Information in the Stage 1 report is being used to develop TMDLs; the Stage 3 TMDL report is expected to be completed in early 2017.[53]

[52] http://www.epa.state.il.us/water/tmdl/report/dupage-salt/stage1.pdf

[53] Scott Ristau, IEPA. Personal email to the author(s). Nov. 15, 2016.

Aquatic Life Designated Use Assessment – Streams

Illinois EPA relies on biological, water chemistry, and physical habitat data to determine the extent to which a stream supports aquatic life. Primarily, three biological indices are used in assessing stream quality: the fish Index of Biotic Integrity (fIBI), the macroinvertebrate Index of Biotic Integrity (mIBI), and the Macroinvertebrate Biotic Index (MBI). Fish IBI scores can range from 1 to 60, mIBI scores from 0 to 100, and MBI scores from 0 to 11. For each index, higher scores indicate better stream quality. Table 36 presents these standards and interpretation related to these indices.

Table 36. Biological indicators used for stream assessments.

Biological Indicator:[54]			
Fish Index of Biotic Integrity (fIBI)	≤ 20	> 20 and < 41	≥ 41
Macroinvertebrate Index of Biotic Integrity (mIBI)	≤ 20.9	> 20.9 and < 41.8	≥ 41.8
Macroinvertebrate Biotic Index (MBI) *(used if mIBI is not available)*	> 8.9	> 5.9 and ≤ 8.9	≤ 5.9
Interpretation:			
Impairment Status	Severe Impairment	Moderate Impairment	No Impairment
Designated Use Support	Not Supporting	Not Supporting	Fully Supporting
Resource Quality	Poor	Fair	Good

Illinois EPA uses a detailed decision matrix combining the biological indices scores with water chemistry data and habitat information to determine the level of aquatic life use support. One of the habitat information sources is another index, the Qualitative Habitat Evaluation Index, QHEI. The QHEI evaluates habitat corresponding to the physical features that affect fish and other biotic communities. The index ranks the conditions of six factors: substrate, instream cover, channel morphology, riparian and streambank conditions, pool and riffle quality, and steam gradient. QHEI scores range from 0 to 100 where higher scores indicate better quality habitat.

Table 37 shows the scores for the Aquatic Life biological indicators for … *[section to be completed].*

[54] Illinois Integrated Water Quality Report and Section 303(d) List - Volume I: Surface Water – 2014. Available at: http://www.epa.state.il.us/water/tmdl/303d-list.html#2014

Table 37. Biological indices scores for assessed streams in the Lower Salt Creek planning area.

Biological Indicator
Year of data collection
Fish Index of Biotic Integrity (fIBI)
Macroinvertebrate Index of Biotic Integrity (mIBI)
Macroinvertebrate Biotic Index (MBI)
Qualitative Habitat Evaluation Index (QHEI)

Fish Consumption Designated Use Assessment

Illinois EPA found the specific cause for Fish Consumption in Fox River Segment DT-23 to be polychlorinated biphenyl (PCB) contamination. PCBs can enter waterways from runoff flowing over poorly maintained hazardous waste sites that contain PCBs; illegal disposal of PCB waste; disposal of products containing PCBs that are dumped into landfills not authorized to handle PCB waste; and sites where electrical transformers containing PCBs have leaked.[55]

Table 38 contains the guidelines used in the Integrated Report for determining impairment status for Fish Consumption from PCBs. The degree of use support for *[section to be completed…].*

[55] "Polychlorinated Biphenyls (PCBs) Basic Information," U.S. EPA, last modified April 8, 2013, accessed December 1, 2014, http://www.epa.gov/osw/hazard/tsd/pcbs/about.htm.

Table 38. Guidelines used for assessing fish consumption designated use.

Degree of Use Support	*Guidelines*
Fully Supporting (Good)	PCBS are less than 0.06 mg/Kg and chlordane is less than 0.16 mg/kg in fish tissue in the two most recent years of samples for each species collected since 1985; and mercury is less than 0.06 mg/kg in fish tissue in the two most recent years of samples for each species collected since 1985, and those samples include at least one predator species of a "large size class" in two different years.
Not Supporting (Fair)	A water body-specific, "restricted consumption" fish consumption advisory is in effect; or, mercury is greater than or equal to 0.06 mg/kg in fish tissue of any species, in at least one of the two most recent years of samples collected in 1985 or later.
Not Supporting (Poor)	A "no consumption" (i.e., "Do Not Eat") fish-consumption advisory, for one or more fish species, is in effect for the general human population; or, a commercial fishing ban is in effect.

3.5.5.2 DRSCW Stream Studies[56]

Biological Assessments

Biological assessments were carried out in the Salt Creek basin in 2007, 2010, and 2013; approximately 42 monitoring locations lie within the Lower Salt Creek planning area (Figure 34, **Error! Reference source not found.**). All data was collected under an Illinois EPA approved Quality Assurance Project Plan (QAPP). Data was gathered for both macroinvertebrates and fish between June and October (inclusive) of the assessment year. The data was used to develop Illinois Index or Biological Integrity (IBI) for both fish and macroinvertebrates. Data for the main stem of Salt Creek are shown graphically in Figure 35 and Figure 36. The Lower Salt Creek planning area begins at river mile 30.

Fish communities sampled in Salt Creek were in poor to fair condition throughout the mainstem (see Table 39 for fIBI scores). The site immediately downstream from the Graue Mill Dam performed the best in all three years with the fish community scoring an IBI of 35 in 2013. The effect is likely created by the ameliorative effect from reaeration imparted by the dam, as the sample site is inside the dam's aeration plume. The Fullersburg Woods Dam is a barrier to several fish species, notably johnny darters and hornyhead chubs, two species that should be found throughout most of the mainstem. IBI scores in 2010 followed the same longitudinal pattern along the length of the mainstem as that observed in 2007, with no statistical difference between years. However, fIBI trended down upstream of the Fullersburg Woods in 2013 even as it trended higher downstream.

[56] This section was written by Stephen McCracken, DRSCW, provided via email correspondence Oct. 28, 2016.

Figure 34. DRSCW monitoring sites in the Lower Salt Creek planning area.

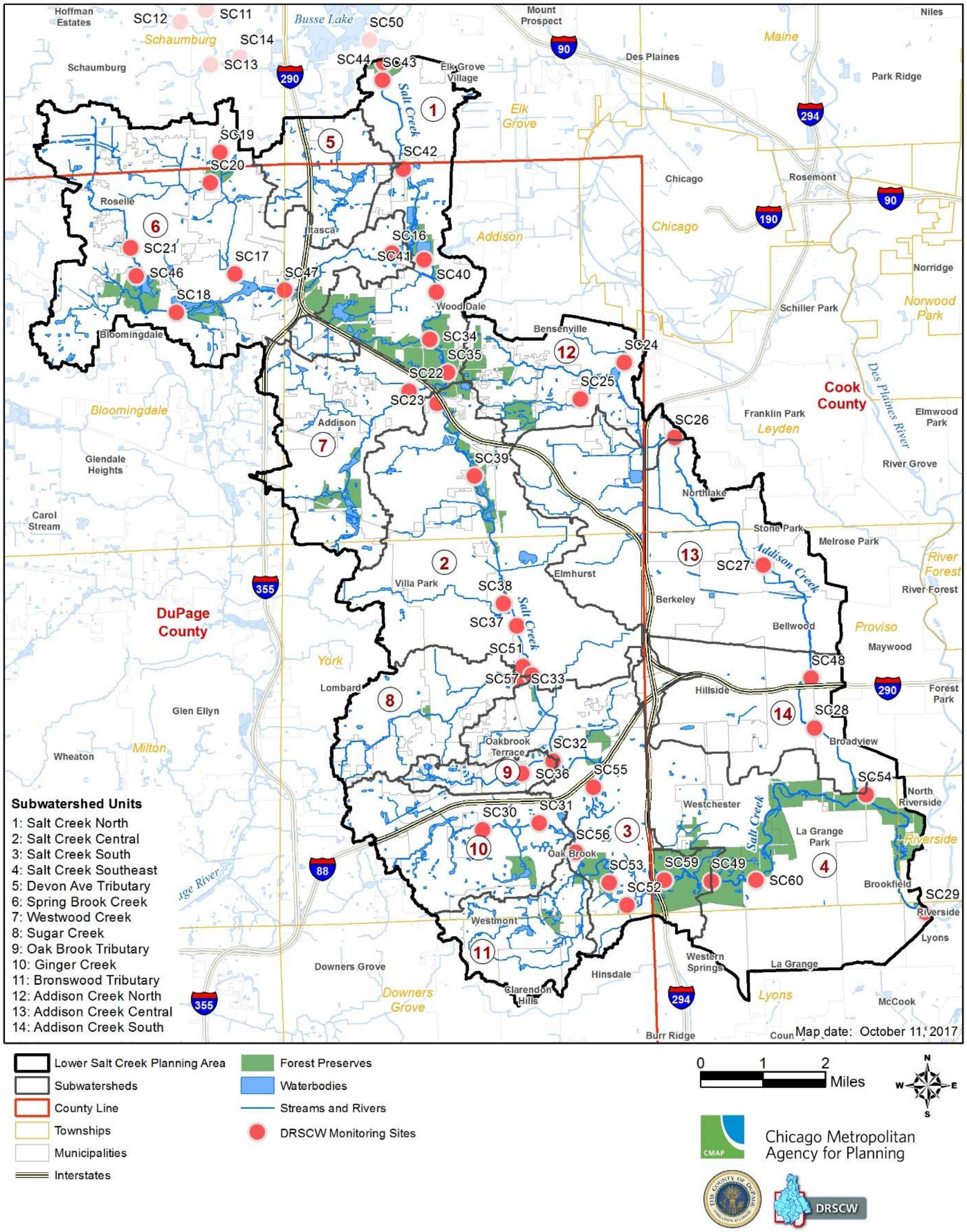
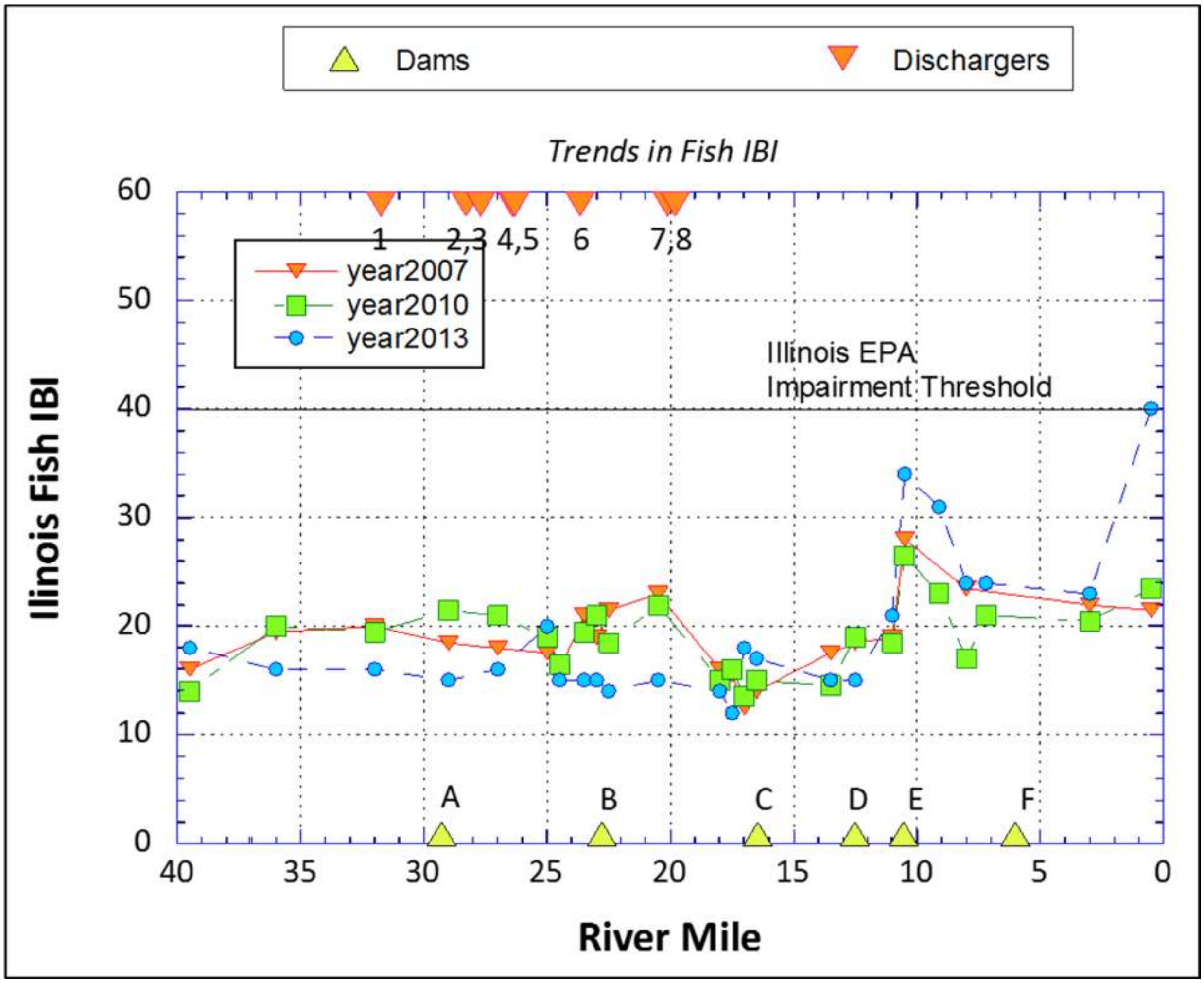
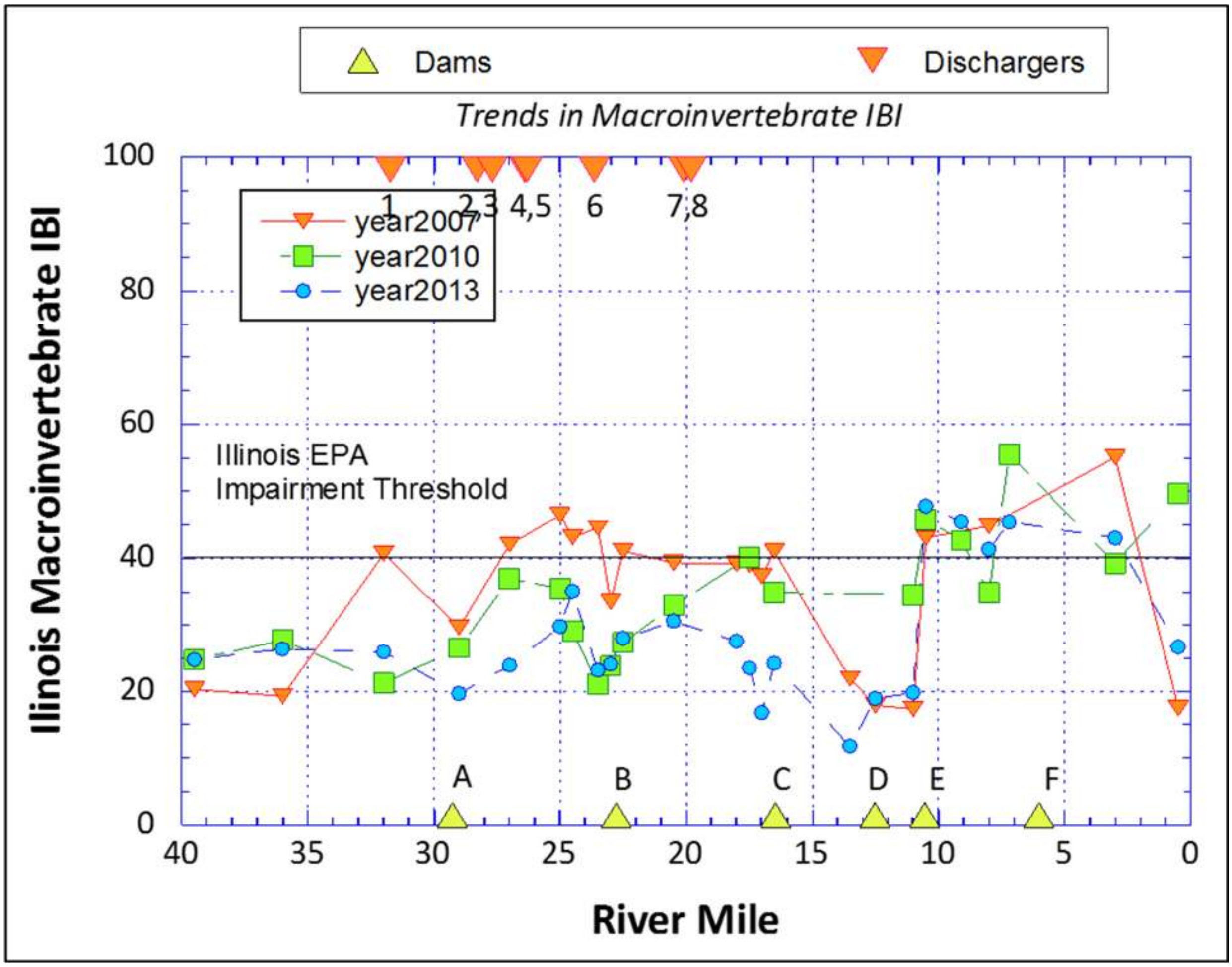


Figure 35. Fish IBI scores for Salt Creek mainstem sites, 2007-2013.



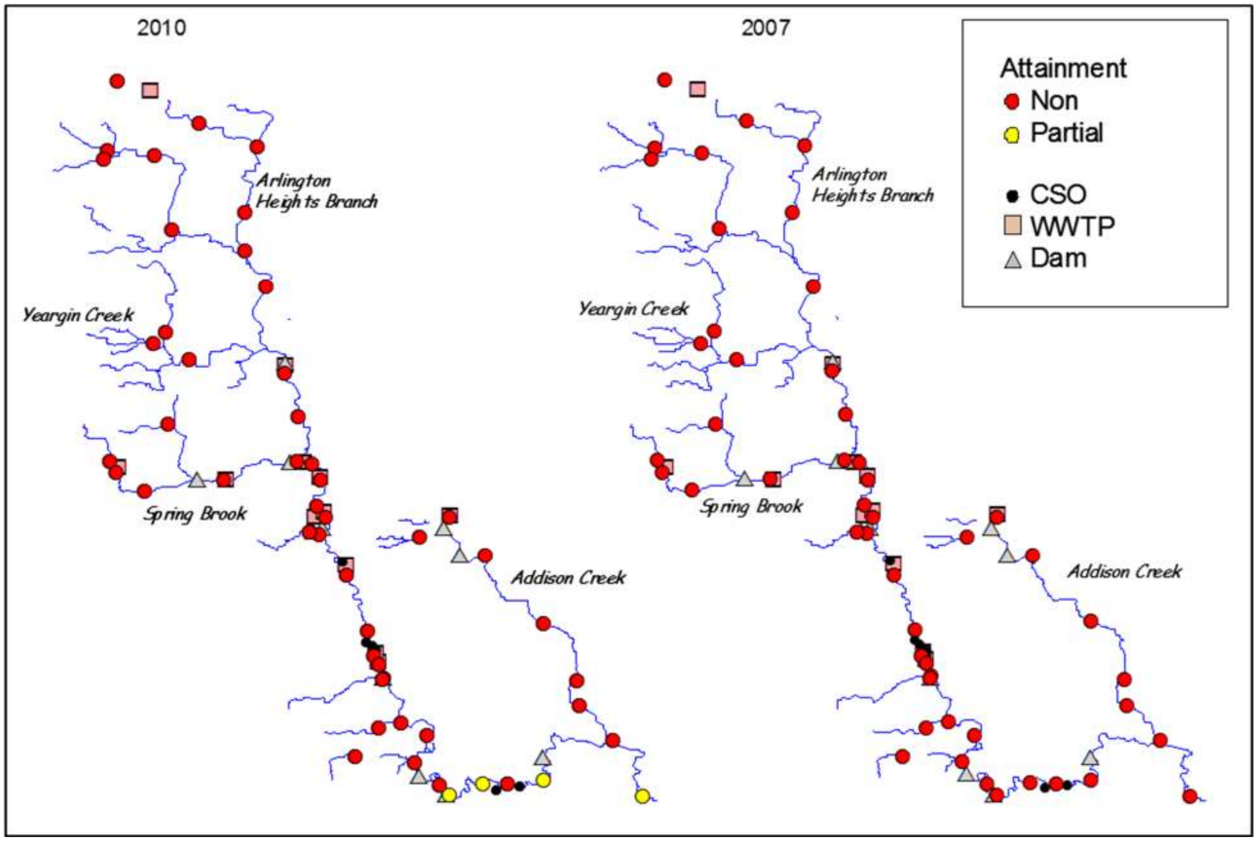
Scores in tributaries throughout the watershed in 2010 and 2013 were typically in the poor to fair range, with the exception of the headwaters of Addison Creek where scores were very poor. Macroinvertebrate communities sampled from the mainstem of Salt Creek were rated as Fair upstream from the Fullersburg Woods Dam, and rated Good at four of six sites sampled downstream from the dam, and Fair at the other two (see Table 39 for mIBI scores). Longitudinally, scores decreased downstream from Spring Brook relative to those upstream. The confluence with Spring Brook marks the reach where several WWTPs discharge in short succession. Otherwise, no clear longitudinal pattern is evident.

Figure 36. Macroinvertebrate IBI scores for Salt Creek mainstem sites, 2007-2013.



Biological attainment in the plan area for 2010 and 2007 is shown in Figure 37. Attainment is achieved by having both macroinvertebrate and fish scores meet or exceed the state thresholds for IBI scores in those communities. In 2007, all main stem and tributary sites failed to meet the aquatic life goal. However, in 2010 and 2013 (not shown), several sites downstream of the Fullersburg Woods Dam were above the mIBI thresholds.

Figure 37. Biological attainment, 2007 and 2010.



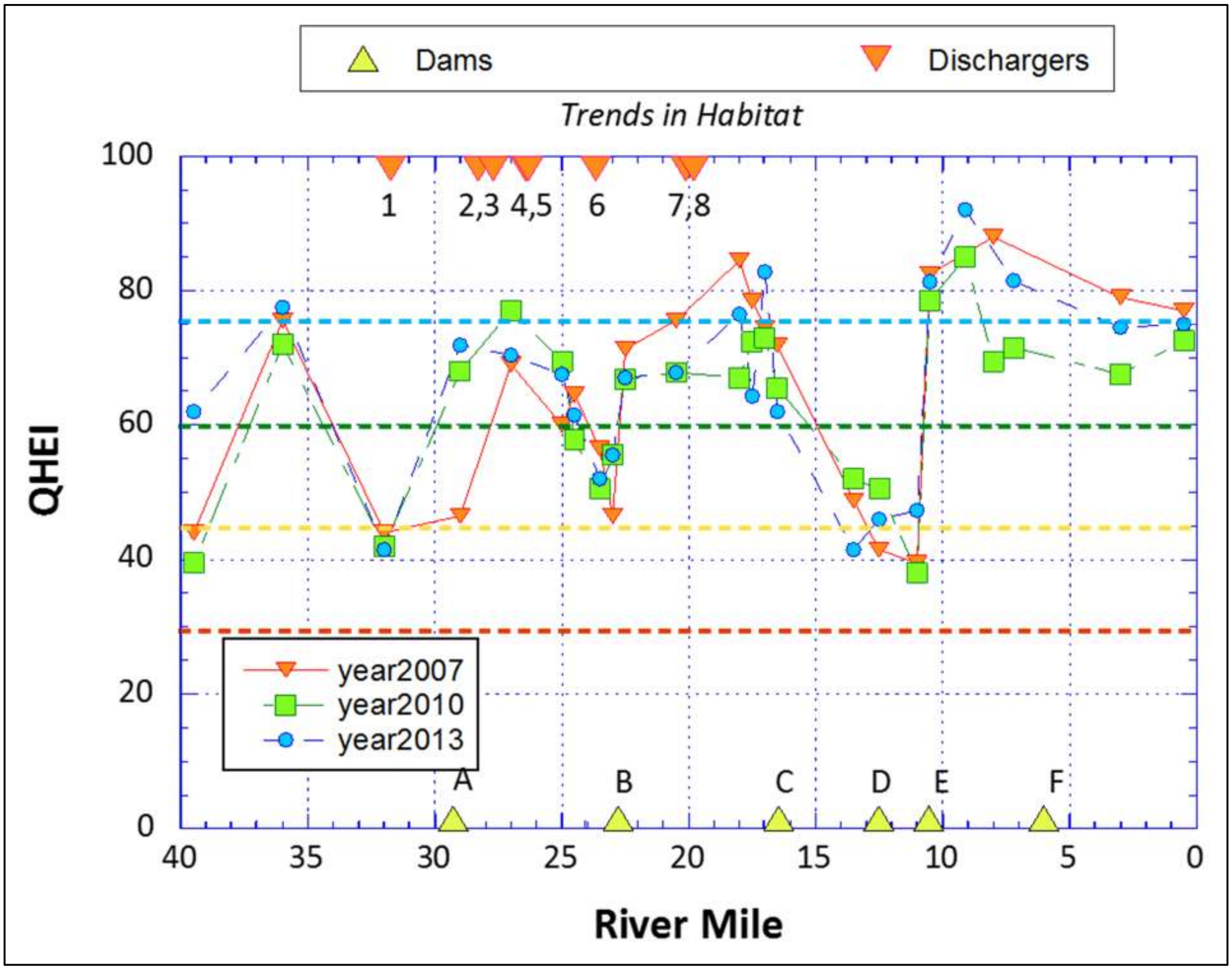
Physical Habitat Assessments

<u>Salt Creek Mainstem</u>

Physical habitat quality was evaluated using the Qualitative Habitat Evaluation Index (QHEI) at 24 sites along the Salt Creek mainstem in 2007, 2010, 2013, and 2016. QHEI is a composite score of substrate, instream vegetation, channel morphology, riparian zone and bank erosion, glide and riffle/run quality, and gradient (see Appendix x).

Most of the sites possessed the types and amounts of habitat features necessary to support aquatic life consistent with beneficial uses (Figure 38, Table 39), with QHEI scores averaging 63.7(+ 12.7 SD). Perhaps more telling, 19 of the sites possessed none of the attributes that characterized stream channels highly modified either directly or indirectly by anthropogenic modifications, and only one site, the most upstream site (SC04, RM 39.5), possessed more than one highly modified attribute. Highly modified attributes are especially deleterious to aquatic life, and an accumulation of two or more at a given site typically precludes a balanced aquatic assemblage. Additionally, the total number of all modified attributes relative to the total number of natural attributes at any given site generally did not overwhelm the ability of the site to support aquatic life, except in the pools behind low-head dams. Lastly, QHEI scores obtained in 2010 were similar to those obtained during the 2006-2007 survey; however, substrate scores in the lower eight miles of the creek were less in 2010, owing to (qualitatively) higher amounts of silt and embedding fines. This appears to have been a transient condition as it had improved in 2013.

Figure 38. QHEI scores for Salt Creek mainstem sites, 2007-2013.



Salt Creek Tributaries

Habitat quality measured in tributaries to Salt Creek varied considerably from site-to-site, and by tributary (see Table 39 for QHEI scores). Where habitat quality varies widely over a reach or within a catchment, the reach average quality tends to be a better predictor of aquatic life than the local habitat quality. Spring Brook generally has good habitat quality, but four of the six sites within the watershed had at least one highly modified habitat attribute, notably little or no sinuosity, a remnant of historic channelization. Westwood, Sugar, Oakbrook and Ginger Creeks all are noted for low sinuosity, again, a function of historic channelization. Addison Creek is, overall, the most modified tributary in the Salt Creek watershed with QHEI scores averaging less than 60, and one or more highly modified attributes found at each site.

Table 39. Status of aquatic life use support for stream segments sampled in the Salt Creek watershed, 2013.

SITE ID	River Mile	Drainage Area (sq mi)	fIBI	MIwb	mIBI	QHEI	Aquatic Life Use Attainment Status	MBI Associated Causes	
Arlington Heights Branch 95-840									
SC06	4.00/4.00	7.7	14.5	na	14.09	45.5	Non - Poor		
SC45	1.50/1.50	10	17	na	26.55	64	Non - Poor		
SC08	0.25/0.25	12.7	14.5	na	28.38	59	Non - Poor		
Baldwin Creek 95-845									
SC05	2.00/2.00	2	17.5	na	17.57	73	Non - Poor		
Salt Creek 95-850									
SC04	39.50/39.50	6.3	18	na	24.8	62	Non - Poor		
SC07	36.00/36.00	16	16	na	26.35	77.5	Non - Poor		
SC15	32.00/32.00	32	16	5.89	26	41.5	Non - Poor		
SC43	29.00/29.00	60	15	8.26	19.66	71.8	Non - Poor		
SC42	27.00/27.00	53.5	16	6.67	23.93	70.3	Non - Poor		
SC41	25.00/25.00	70	20	7.41	29.77	67.5			
SC40	24.50/24.50	75	15	6.9	35.08	61.5	Non - Poor		
SC34	23.50/23.50	76	15	6.18	23.19	52	Non - Poor		
SC35	23.00/23.00	80	15	6.67	24.1	55.5	Non - Poor		
SC23	22.50/22.50	84	14	6.53	28.04	67	Non - Poor		
SC39	20.50/20.50	86	15	5.12	30.6	67.8	Non - Poor		
SC38	18.00/18.00	87	14	5.95	27.58	76.5	Non - Poor		
SC37	17.50/17.50	95	12	5.88	23.45	64.3	Non - Poor		
SC51	17.00/17.00	95	18	4.73	16.79	82.8	Non - Poor		
SC57	16.50/16.50	95	17	5.68	24.23	62	Non - Poor		
SC55	13.50/13.50	102	15	6.58	11.79	41.5	Non - Poor		
SC56	12.50/12.50	107	15	6.39	18.91	46	Non - Poor		
SC53	11.00/11.00	110	21	6.92	19.78	47.3	Non - Poor		
SC52	10.50/10.50	112	34	9.17	47.79	81.3	Non - Good		
SC59	9.10/9.10	113	31	8.04	45.5	92	Non - Good		
SC49	8.00/8.00	114	24	8.09	41.27	-	Non - Fair		
SC60	7.20/7.20	118	-	-	45.43	81.5	Full		
SC54	3.00/3.00	145	23	7.89	43.09	74.5	Non - Good		
SC29	0.50/0.50	150	40	8.09	26.7	75	Non - Fair		
Tributary to Salt Creek 95-851									
SC01	2.00/2.00	1.1	24	na	38.43	76	Non - Fair		
Tributary to Salt Creek 95-852									
SC02	0.25/0.25	0.9	15	na	32.67	61	Non - Poor		
Tributary to Salt Creek 95-853[57]									
SC03	0.50/0.50	2.5	25.5	na	25.03	70.5	Non - Fair		

[57] Cross-listed as Salt Creek at river mile 42.06 to conform with IEPA segment definition.

SITE ID	River Mile	Drainage Area (sq mi)	fIBI	MIwb	mIBI	QHEI	Aquatic Life Use Attainment Status	MBI Associated Causes	
Tributary to Salt Creek 95-855									
SC11	5.00/5.00	4	14	na	34.49	-	Non - Poor		
Tributary to Salt Creek 95-856									
SC14	2.50/2.50	10	15	na	32.55	82.8	Non - Poor		
Yeargin Creek 95-857									
SC12	0.25/0.25	1.8	17.5	na	22.88	58	Non - Poor		
Ginger Creek 95-858									
SC30	1.50/1.50	5.2	14	na	27.01	71.5	Non - Poor		
Sugar Creek 95-859									
SC33	0.25/0.25	3.5	11	na	14.69	60	Non - Poor		
Addison Creek 95-860									
SC24	10.50/0.00	2	13	na	-	54	Non - Poor		
SC26	8.00/8.00	5	5.5	na	20.37	51.5	Non - Poor		
SC27	5.00/5.00	10	14.5	na	25.48	53.5	Non - Poor		
SC48	2.50/2.50	18	9.5	na	14.61	52	Non - Poor		
SC28	1.50/1.50	20	13.5	na	13.38	55	Non - Poor		
Trib to Addison Creek 95-861									
SC25	0.50/0.50	1	18	na	21.52	53	Non - Poor		
SC21	6.50/6.50	2	14	na	15.48	-	Non - Poor		
SC46	6.00/0.00	3.5	13	na	-	67	Non - Poor		
SC18	4.50/4.50	5.1	6	na	24.11	67	Non - Poor		
SC47	2.50/2.50	10	21	na	16.57	68.5	Non - Poor		
SC16	0.25/0.25	14.2	20	na	17.19	67	Non - Poor		
Oakbrook Creek 95-875									
SC36	0.50/0.50	0.8	29	na	29.9	65	Non - Fair		
SC32	0.25/0.25	1.2	27	na	18.46	0	Non - Poor		
Trib to Meacham Creek 95-881									
SC20	0.25/0.25	2	12	na	14.33	37	Non - Poor		
Westwood Creek 95-882									
SC22	0.50/0.50	4	8	na	17.31	53	Non - Poor		

Narrative Ranges for Illinois fIBI and mIBI scores

fIBI		mIBI	
Restricted	0-21	Poor	0-21
Limited	21-30	Fair	21-40
Moderate	31-40	Good	41-70
High Value	41-50	Excellent	70-100
Unique	51-60		

Water Chemistry

Water column chemistry was sampled in the planning area at approximately 42 sites between June and September of 2007, 2010, 2013, and 2016. Sediment was sampled at 24 sites in the plan area. Samples sites were collected at various drainage basin sizes and bracketing dams, waste water treatment plants, and CSOs. A list of the parameters collected are given in Table XX.

Salt Creek drains a highly urbanized landscape with a high population density. Pollutants associated with urbanized landscapes, especially metals, hydrocarbons and road de-icing compounds enter the stream with stormwater. Because metals and hydrocarbons are typically adsorbed to sediment particles, those pollutants accumulate in the sediments. However, de-icing compounds, being soluble, persist in the water column. The water quality footprint resulting from de-icing compounds is most obvious in the small tributaries, and especially in the headwater network upstream from the confluence with Spring Brook. Concentrations of suspended solids were also ubiquitously high, a likely function of the urbanized nature of the watershed, algae from stormwater ponds, and possibly the dispersive effect of monovalent ions on clay.

Given the high population density in the watershed, treated municipal effluent comprises a significant fraction of the total flow in Salt Creek, and strongly influences its water quality, especially with respect to nitrogen and phosphorus. Phosphorus concentrations north of the plan area appear typical of developed landscapes, but not necessarily excessive. However, starting at the first major treatment plant, at the northern extent of the plan area, concentrations become highly elevated, with little or no assimilation occurring down the run of the river. Nitrate concentrations follow an essentially identical pattern, going from background concentrations (e.g., < 1 mg/l) to highly elevated (e.g., > 3 mg/l). Total Kjeldahl nitrogen (TKN) also increases downstream from where the treatment discharges begin. TKN can signal organic enrichment; however, as a by-product of treated domestic sewage, it can also represent refractory organic nitrogen. Indeed, biological oxygen demand did not increase significantly in relation to waste water plants suggesting that refractory nitrogenous compounds were a significant fraction of the TKN measured in the middle reach (river miles 15 to 25) that receives most of the discharge. Ammonia nitrogen concentrations were influenced by the treatment plants; however, the cluster of combined sewer overflows that discharge to the reach immediately upstream from the Graham Center dam appeared to raise the mean concentration above that which is chronically toxic to sensitive organisms.

Dissolved oxygen (DO) concentrations were measured in Salt Creek with automated sensors at three to eight locations between June and September since 2007. The automated sensors also collected water temperature, pH, and conductivity measurements at hourly intervals.

3.5.5.3 Sierra Club Stream Monitoring

3.5.5.4 Lake Charles

Lake Location, Ownership, Use, and Morphometry

Section to be completed…

Lake morphometric information is provided in Table 40.

Table 40. Lake Charles morphometric information.

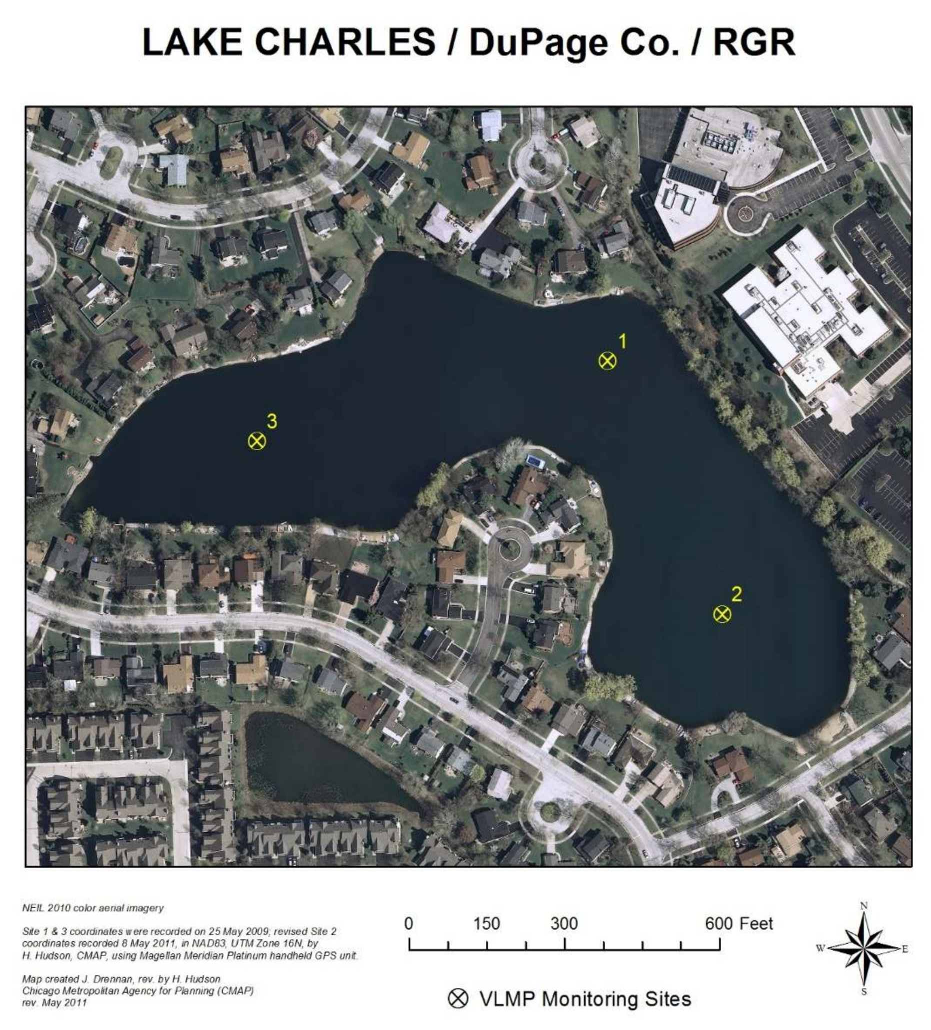
Illinois EPA lake code	IL_RGR
Surface Area[a]	
Maximum Depth[a]	
Average Depth[a]	
Volume[a]	
Shoreline Length[a]	
Lake Elevation[a]	
Watershed Area[b]	
Watershed to lake ratio	
Average Water Residence Time / Flushing Time[a]	
Lake Type	Dug

Current Water Quality Conditions

Section to be completed using VLMP data…

Secchi disk.

Figure 39. Water quality monitoring sites in Lake Charles.



Site	Easting	Northing	Latitude	Longitude	Depth (ft)
1	16 420506 E	4629714 N	41.81532 N	87.95710 W	19 - 20
2	16 420571 E	4629564 N	41.81398 N	87.95629 W	6 - 7
3	16 420299 E	4629670 N	41.81490 N	87.95959 W	5 - 6

Table 41. Average annual water quality characteristics for Lake Charles.

IEPA lake code		IL_RTZD					
Year		2014 VLMP			2015 VLMP		
Parameter	*Units*	*Site 1*	*Site 2*	*Site 3*	*Site 1*	*Site 2*	*Site 3*
Secchi transparency	inches						
	feet						
Total Phosphorus (TP)	mg/L						
Dissolved Phosphorus (DP)	mg/L						
Nitrite + Nitrate Nitrogen (NO_2+NO_3)	mg/L						
Ammonia Nitrogen (NH_3)	mg/L						
Total Kjeldahl Nitrogen (TKN)	mg/L						
Total Suspended Solids (TSS)	mg/L						
Volatile Suspended Solids (VSS)	mg/L						
Dissolved Solids (DS)	mg/L						
Chloride (Cl)	mg/L						
Alkalinity	mg/L						
Conductivity	µS/cm						
pH	units						
Chlorophyll *a* (corrected)	µg/L						
TSI_{Secchi}	--						
$TSI_{phosphorus}$	--						
$TSI_{chlorophyll}$	--						

Aquatic Plants

Section to be completed based on VLMP data …

Fisheries

Section to be completed pending data from HOA…

Lakeshore Buffer Condition

Lake Charles' riparian (lakeshore) buffer zone was assessed by CMAP staff using a qualitative methodology that considered an area up to 25 feet inland from the shoreline and for a width of a coded segment, typically bounded by a lot or parcel boundary. A 25 foot buffer was chosen based on research that indicates a 25-foot vegetated buffer is the minimum effective width for in-lake habitat maintenance (a 15 foot buffer is considered the minimum effective width for bank stability).[58] The following land cover categories were estimated for each parcel segment: turfgrass lawn, flower beds, unmowed grasses & forbs, tree trunks, shrubs, beach, impervious

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[58] http://www.vtwaterquality.org/lakes/htm/lp_shorevegandbuffers.htm and http://www.watershedmanagement.vt.gov/lakes/docs/lp_shorelandbufferwidths.pdf (accessed September 2014)

surface. Criteria used for category assignment are presented in Table 42. Field assessment was conducted by boat and foot during October and November 2016; the results are presented in Table 43, Figure 40, and Appendix x.

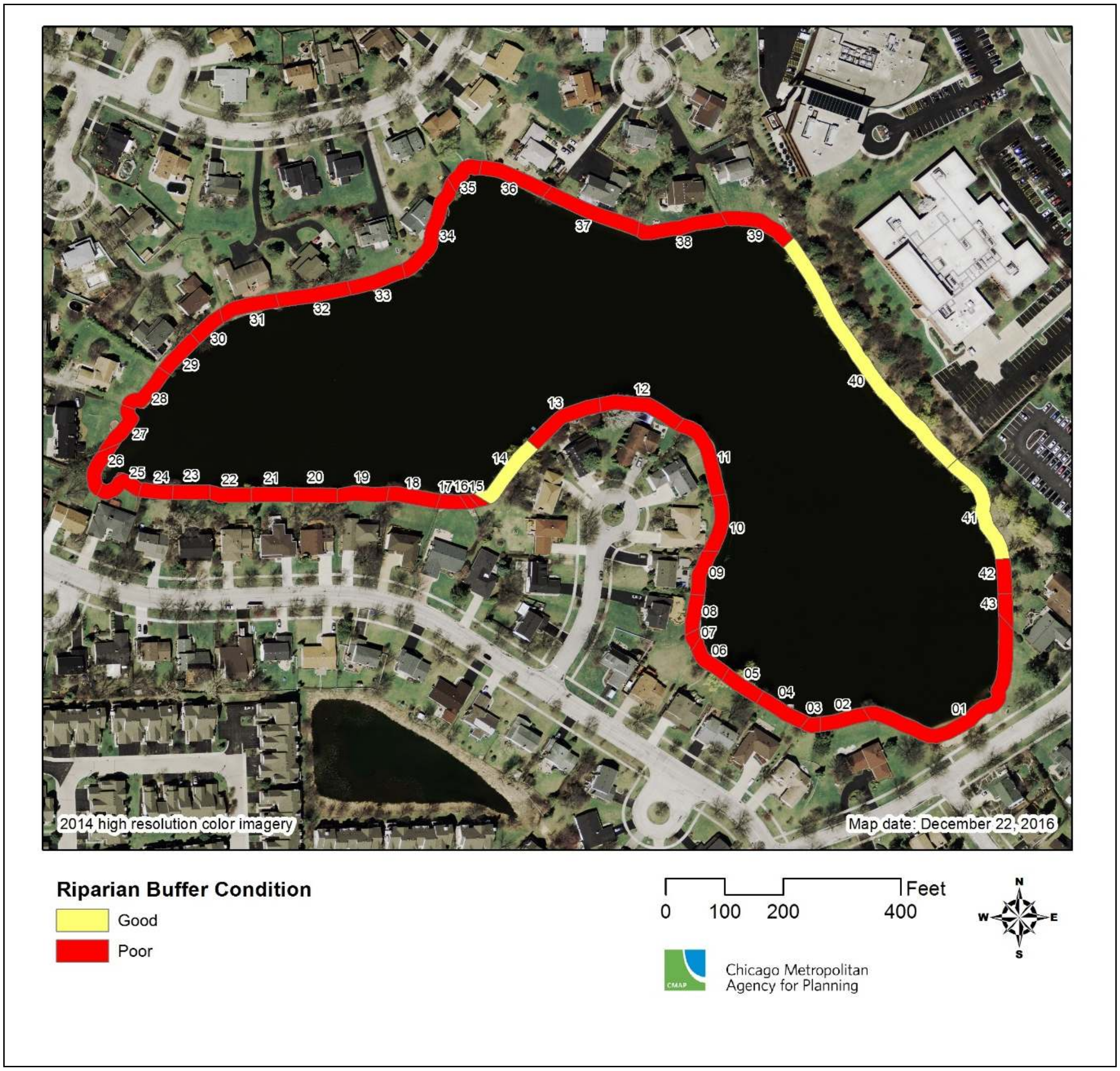
Table 42. Criteria used for categorizing riparian buffer condition.

Category	*Criteria*	
Very Good	Unmowed grasses & forbs + Tree trunks + Shrubs *and* Impervious surface	≥ 90% ≤ 10%
Good	Unmowed grasses & forbs + Tree trunks + Shrubs *and* Impervious surface	≥ 70% and < 90% ≤ 30%
Fair	Unmowed grasses & forbs + Tree trunks + Shrubs *and* Impervious surface	≥ 50% and < 70% ≤ 50%
Poor	Turfgrass lawn + Flower beds + Beach + *and* Impervious surface	< 50% > 50%

Table 43. Lake Charles riparian buffer assessment summary.

Category	*Shoreline length (ft)*	*Percent*
Very Good	0	
Good		
Fair	0	
Poor		
Totals	**4,432**	

Figure 40. Lake Charles riparian buffer assessment, 2016.



Shoreline Erosion Assessment

Lake Charles shoreline erosion condition was assessed by CMAP staff during October 2016 via observation from a rowboat. Each segment was the same as used for the lakeshore buffer assessment, typically the width of a lot or parcel. The criteria used for assigning erosion categories were as follows:

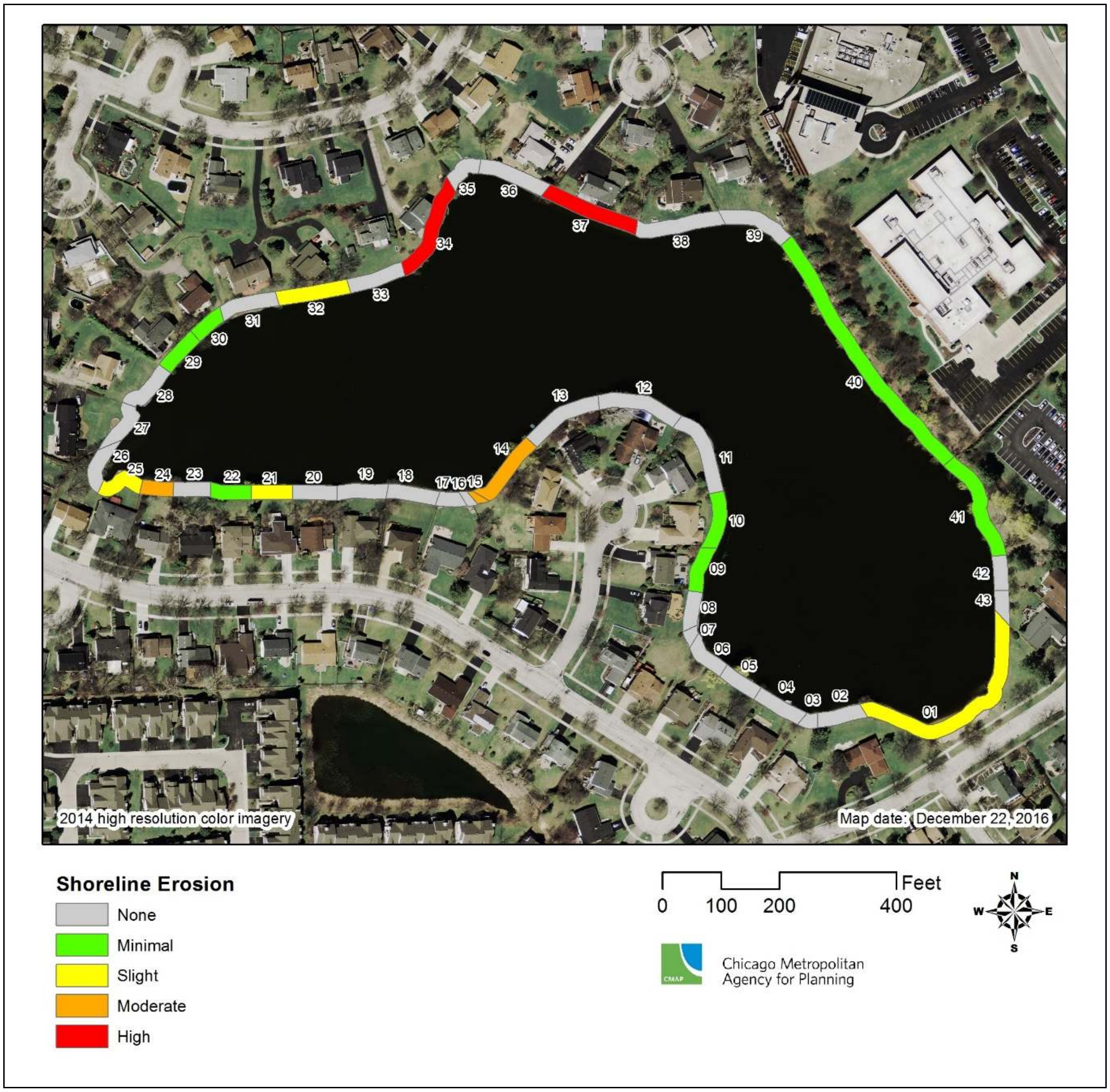
- None: no erosion evident; these segments typically had a concrete or steel seawall
- Minimal: minor erosion; some bare soil areas evident; considered generally stable
- Slight: low erosion; approximately 3-6" bank heights
- Moderate: approximately 6-12" bank heights; sloughing, undercutting, or ice heave often evident
- High: approximately 12-24" bank heights; sloughing, undercutting, or ice heave often evident

The results of the assessment are presented in Table 44, **Error! Reference source not found.** Figure 41, and Appendix x. An estimate of pollutant loads from shoreline erosion was made using the STEPL model. *[Note: totals shown in table below. Data by erosion level will be added…]*

Table 44. Lake Charles shoreline erosion assessment and pollutant load estimates summary.

Erosion Level	*Shoreline length (ft)*	*Percent*	*Nitrogen Load (lb/yr)*	*Phosphorus Load (lb/yr)*	*Sediment Load (ton/yr)*
None					
Minimal					
Slight					
Moderate					
High					
Totals	**4,432**		**35.1**	**13.5**	**19.1**

Figure 41. Lake Charles shoreline erosion, 2016.



3.6 Land Management Practices

3.6.1 Comprehensive and Other Local Plans

There are 33 municipalities and two counties within the Lower Salt Creek Watershed. Most of these municipalities have adopted a comprehensive plan to guide development, transportation, and conservation. The plans address natural resource and water resource concerns to varying degrees. Many plans would benefit from fuller consideration of natural resource elements, and several are old enough that they require updates to reflect more recent developments and modern practices. The following section discusses the elements of each comprehensive plan that potentially impact water quality and watershed health. Other related plans that have been adopted are also included.

Addison (DuPage Co.)

The Village of Addison adopted its Comprehensive Plan in 2013. The Plan establishes a general vision for future development in the community and includes specific recommendations for land use, transportation, and natural areas. The Plan supports a node-centric approach to development by concentrating mixed-use, pedestrian-friendly development along major roads such as Lake Street. Addison is nearly built out, so the Plan focuses on redevelopment in specific areas of the Village: the former golf course at the northwest corner of Mill and Army Trail Roads, the former Driscoll School, town center, and Shemin Nursery. The Village also aims to modernize existing industrial areas through physical improvements and updated regulations, and boost commercial development at Addison Commons and Centennial. The Plan recommends that design and construction of new development meet LEED standards by integrating smart location choice, strong neighborhood design, green infrastructure, and green buildings.

Addison residents have access to six Metra stations within four miles of the Village's boundaries. The Village also has access to bike trails including the Salt Creek Greenway Trail. The Plan supports creating non-motorized transportation opportunities through improvements in transit, pedestrian, and biking conditions. Recommended improvements include better transit connections, pedestrian and bike safety measures, and trail expansion.

The Comprehensive Plan has a section dedicated to natural features. It identifies flooding of Salt Creek as a major concern and recognizes the role of parks and open space in stormwater management. The Comprehensive Plan notes that Addison has adopted a comprehensive Stormwater and Floodplain Ordinance that aims to "protect, conserve and promote the orderly development of land and water resources." The Ordinance contains development requirements, run-off minimization measures, and early installation of detention storage areas. The Village is also participating in a joint community effort to modify the Busse Woods Dam which would serve to reduce flooding along Salt Creek. There are few opportunities for new open areas in the Village, but the Plan proposes requiring new developments built on over two acres to accommodate open space that is “pervious and usable for recreation and stormwater management.”

Bellwood (Cook Co.)

The Village of Bellwood adopted its Comprehensive Plan in 2013. It includes specific recommendations for land use, housing, economic development, mobility, and community identity. The Plan emphasizes mixed-use, transit-oriented development (within ¼ to ½ mile of rail, bus or transit lines) to increase the density and walkability of the Village. Infill development and redevelopment are encouraged as other means to increase the Village’s density. Redevelopment is prioritized at sites near the two Metra Stations and along major CTA and Pace routes. The Plan identifies and outlines details for six target redevelopment areas in an effort to reinvigorate existing commercial areas. These area-specific plans emphasize mixed-use development in achieving the Village’s goals for redevelopment.

Bellwood has access to three expressways, a US highway, Metra, two freight lines, Pace, and the Illinois Prairie Path. By encouraging transit-oriented development the Village hopes to increase transit ridership. The Plan also encourages streetscaping (e.g., lighting, tree lawns, and sidewalk improvements) and connecting transit options to the Illinois Prairie Path to promote walking and biking. In addition, the Plan encourages paved trails along waterways to provide a safe path for travel and also to minimize disturbance caused by flooding by allowing water to infiltrate.

Although the Plan does not contain a separate natural resources section, it does identify the Village’s parks and encourages provision of open space in areas not currently served. The Plan encourages enhanced connectivity through open space corridors and by incorporating a linear greenway along Addison Creek. Flooding of Addison Creek is an issue in Bellwood. The Village proposes creating a retention reservoir to help resolve flooding issues. Furthermore, the Plan prioritizes transforming Addison Creek into a valuable public outdoor and recreational corridor.

Bensenville (DuPage Co.)

The Village of Bensenville adopted its Comprehensive Plan in 2015. It specifically addresses future land use, transportation, and natural areas. Bensenville is built out, so the Plan focuses on redevelopment and better use of existing areas. The Plan prioritizes higher-density residential and mixed-use developments in the downtown area around Towne Center Park and along Main Street in order to meet projected growth and demand for housing. Higher density, mixed-use developments that are walkable and well-connected by transit support aging in place which is a Village priority. The Plan contains six sub-area plans, four of which are commercials corridors and two industrial corridors. Elements of these plans include shared parking, access management, streetscape and gateway improvements, and stormwater management. Stormwater management includes additional buffering for redevelopment along Silver Creek, on-site detention, and permeable pavement.

The Village will continue to support local and regional roadway improvements along with improvements to public transit. The Village is served by Metra, Pace, and Dial-A-Ride. Recommended improvements to transit include increased service frequency and better transit connections. Bensenville has no existing bike trails within its boundaries, but the Plan encourages the creation of a local bicycle network and bicycle-pedestrian master plan. In addition, the Plan encourages streetscaping and improved pedestrian amenities, which include lighting, landscaping, pavement, furnishings, and signage.

The Plan has a separate natural areas section and there is a stormwater management element throughout. Silver and Addison Creeks experience flooding. The Plan recommends several stormwater infrastructure improvements (e.g., sewer replacements) in addition to green infrastructure. The Comprehensive Plan notes that the Village has adopted the DuPage County Stormwater and Floodplain Ordinance, which requires best management practices (BMPs) on development sites to promote runoff reduction. The Plan promotes that the Village consider creating an ordinance tailored to its own needs. The Village also recognizes the role of parks and open space in stormwater management, and encourages expanding open space. Furthermore, Bensenville celebrates Arbor Day and supports installing street trees.

Berkeley (Cook Co.)

The Village of Berkeley updated its Comprehensive Plan in 2009. It lays out a vision for future development and includes specific recommendations for land use, transportation, economic development, community resources, and sustainable development. Berkeley is a compact, primarily single-family residential community with walkable neighborhoods and with a commuter rail and bus service that connects residents to jobs. The Plan focuses on redevelopment of existing sites for future land use. The Plan contains subarea plans for the St. Charles Road Corridor, Berkeley Metra Station, and the Village Center, which focus on mixed-use, transit-oriented development, functionality, and sustainable design.

Berkeley supports a transportation system that minimizes impact on the environment, which includes minimizing automobile traffic where possible, encouraging a pedestrian-friendly, walkable environment, and use of public transit. Berkeley is served by Metra and Pace; the Plan supports upgrades to the Metra tracks and other improvements to these transit systems. The Plan also supports streetscape improvements to improve aesthetics and safety, which will encourage walking and biking.

The Comprehensive Plan notes that parks and open space account for approximately 1.7% of the total land area in Berkeley. The Village does not have forest preserves, rivers, streams, or other natural resources within its boundaries. Although the Plan does not contain a section dedicated to natural areas, its Sustainable Development chapter addresses quality of living, energy efficiency, recycling and solid waste management, air quality, low-impact development, open space and natural resources, and telecommunications infrastructure. Flooding is an issue in some neighborhoods as a result of significant storms; the Plan identifies low-impact development, green infrastructure, stormwater management fees, and impervious surface limitations as practices to reduce flooding. In addition, the Plan supports the redevelopment of brownfield sites as a means to increase open space. Furthermore, the Village of Berkeley is a Tree City USA community commended nine times by the Arbor Day Foundation in cooperation with the National Association of State Foresters and the USDA Forest Service. The Forestry Department maintains over 1000 parkway trees lining 22 miles of streets.

Bloomingdale (DuPage Co.)

The Village of Bloomingdale updated its Comprehensive Land Use Plan in 2010. The Plan includes a detailed existing conditions report followed by more brief sections that outline the Village's goals for land use, parks and open space, transportation, and Village identity. The Plan supports infill development and redevelopment that complements and supports adjacent uses. The Plan outlines specific development recommendations for 21 "strategic locations." Some of these recommendations include mixed residential and low-impact commercial development, but mixed-use development does not serve as an overall goal of the Plan.

The Plan supports improvements to pedestrian and biking conditions to encourage walking and biking as alternative modes of transportation. Recommended improvements include adding bicycle facilities (e.g., bike racks), establishing pedestrian/bicycle friendly connections, and expanding recreational pathways that "link residential areas to parks, forest preserves, schools, shopping, employment centers, and the larger regional pedestrian pathway network." The Plan also recommends improvements to public transportation by cooperating with other communities, but further detail is not included. Furthermore, the plan encourages shared parking and land banked parking to minimize pavement coverage and maximize landscaping.

The Plan calls for the preservation of open space and identifies Indian Lakes Resort, Hilton Indian Lakes Golf Course, and the Bloomingdale Golf Course as significant open space areas. It also promotes energy conservation and sustainability in residential homes and beautification of neighborhoods by planting street trees. However, identification and discussion of the Village's water and natural resources is lacking. Although the Plan encourages green infrastructure, such as permeable pavement, bioswales, and vegetated filter strips, there is no further discussion of stormwater management.

Broadview (Cook Co.)

The Village of Broadview updated its Comprehensive Plan in 2006. The plan addresses land use, housing, transportation, and community facilities. The Plan is brief. It encourages mixed-use development, for Broadview is mostly built-out. Mixed-use developments currently exist along portions of the Roosevelt Road Corridor and along 17th Avenue, and the Village recognizes mixed-use as an opportunity for redevelopment projects that respond to changing market conditions. The Plan also recognizes the potential for mixed-use development near transit, but such is dependent on the location of a new train station that has yet to be determined.

The Village is serviced by freight rail that provides access to the industrial areas of Broadview, but a commuter rail service (i.e., Metra) does not run through Broadview. The Plan encourages rail and bus transit as alternative modes of transportation and supports establishing a commuter rail service through the Village. This would not only benefit the community but also reduce reliance on vehicles. Although the Plan supports developing a trail system along Addison Creek, it does not emphasize walking and biking as part of the Village's transportation system.

The Plan does not have a separate parks and open space section, but includes a short description of the Village's parks under is Community Facilities section. Broadview has six parks, and the Plan recommends expanding Playdale Park and developing several new parks. The Plan lacks discussion of water and natural resources, nor does it include stormwater management recommendations.

Brookfield (Cook Co.)

The Village of Brookfield adopted its Comprehensive Plan in 2004. The Plan establishes the Village's vision for future development and provides specific recommendations for land use, housing, economic development, transportation, environment, Village identity and design, intergovernmental and organizational cooperation, and program administration. Brookfield is primarily a residential community and it is nearly built-out. Commercial areas are located primarily along major commercial corridors, including 31st Street and Ogden Avenue, the Eight Corners Area, and Downtown Brookfield. The Plan presents detailed subarea plans for these areas, which promote walkability, mixed-use, and transit-oriented development.

The Village is currently served by Metra and Pace, and the Plan recommends improvements to these services. The Plan also encourages improving the Walk to Zoo Route and developing a bike/multi-use trail along Salt Creek to connect the north and south sides of the community. Furthermore, general suggested improvements to walking and biking conditions include limiting curb cuts, implementing wayfinding signs, and creating bicycle facilities.

The Village has nine parks totaling 51.53 acres. The Village is continuing to seek opportunities for the acquisition and development of parks and recreation amenities in order to better serve the population. Cook County Forest Preserves has a large preserve located within the Village along Salt Creek. The Plan encourages continued support of the Forest Preserve District's mission, which is "to acquire and hold lands containing one or more natural forests, for the purpose of protecting and preserving the flora, fauna, and scenic beauties." The Village aims to protect and enhance environmentally sensitive areas, including the Salt Creek Corridor and forest preserve. There is no further discussion of natural or water resources. The Plan encourages tree planting and landscaping in street design, but for aesthetic purposes rather than to minimize stormwater runoff.

Clarendon Hills (DuPage Co.)

The Village of Clarendon Hills adopted its Comprehensive Plan in 1991, which primarily addresses future development and municipal services. The Plan encourages preserving the residential nature of the Village. In the Village's central business district, the Plan encourages an optimal mix of land uses and enhancing the Village's aesthetic elements (e.g., streets, sidewalks, parkways, and lighting). The Village is nearly built-out, so the Plan supports redevelopment of sites, such as reusing industrial properties for multi-family residential, institutional, or commercial purposes.

The Plan lacks detail on transportation. The Plan addresses traffic circulation and recommends traditional techniques to re-route or reduce traffic, which include additional traffic signals and speed limits. Although the Plan recommends improvements to sidewalks, parkways, signage, lighting, landscaping, and furniture areas, which serve to enhance pedestrian conditions, it does not emphasize alternative modes of transportation as a means to reduce vehicular traffic.

The Plan's goals and objectives address important natural resource issues. The Plan recognizes the need for open space even at the expense of new development, and when land is unsuitable for development. The Village has several large parks, and the Plan supports that existing parks and open space be maintained and expanded. The Plan encourages the use of trees, shrubs, bushes, flowers, and other plants in landscape design to promote drainage. In addition, it calls for protecting surface water resources and natural groundwater recharge areas from pollution and encroachment of urban development. Furthermore, the Plan encourages that open space should be combined with stormwater retention or detention if size and topography are adequate.

Downers Grove (DuPage Co.)

The Village of Downers Grove updated its Comprehensive Plan in 2011. The Plan is detailed and specifically addresses land use, transportation, parks and open space, and community facilities. The Village's residential districts are largely developed, so new residential development will occur in the form of alterations or additions to existing housing stock. The Plan encourages sustainable energy and green building initiatives in residential areas. The Village's downtown area is characterized by mixed-use development, and the Plan encourages a diverse mix of uses be maintained in this area. The Plan also outlines recommendations for five key focus areas: Belmont/Ellsworth, Downtown, Butterfield, Ogden, and Fairview. The focus areas are intensely developed, economic generators with important transportation facilities, and they are highly visible to residents. The Plan emphasizes reducing the heat island effect and encouraging brownfield redevelopment in the Village's redevelopment efforts.

Downers Grove is serviced by Metra and Pace, and the Plan supports improvements that prioritize public transportation. These include modifying or expanding bus routes, implementing Intelligent Traffic Systems (ITS), and coordinating shuttle service to Metra. Furthermore, the Village adopted a Bikeway Plan in 2000, and the Comprehensive Plan emphasizes pedestrian and bicycle mobility. The Comprehensive Plan supports improvements to existing biking and walking conditions, which include: better connections, safety initiatives, sidewalk installation, streetscaping, and wayfinding signage.

The Plan includes a detailed Parks, Open Space, and Environmental Features section. Stormwater management is emphasized throughout the Plan. The Village relies on the use of natural features, such as creeks, marshes and rivers, as part of its stormwater management system. Lacey Creek, St. Joseph Creek, and Prentiss Creek flow within Downers Grove and drain into the East Branch of the DuPage River. The Plan also supports the use of naturalized stormwater retention and detention basin areas, and stormwater management practices in development and parking areas. In addition, the Plan supports limiting development within floodways and floodplains. Furthermore, the Plan emphasizes the importance of the Village's tree canopy, and recommends additional plantings with new development. The Plan also encourages that publicly owned trees and wooded areas be preserved.

The Village updated its Stormwater Master Plan in 2006. The Plan provides information about the existing stormwater issues in the Village, the condition of the stormwater system, the adequacy of system components, and estimated costs for necessary maintenance, capital improvements, and regulatory requirements. The Plan provides the Village with information for establishing strategies for future infrastructure management, identifying preliminary budgetary needs, and identifying alternatives for financing an adequate stormwater program. The Plan provides recommendations for residential redevelopment, water quality monitoring, BMPs, good housekeeping practices, stormwater storage areas, floodplain buyout, public education and outreach, and operations and maintenance.

The Village also developed a Watershed Infrastructure Improvement Plan (WIIP) in 2007 to assess drainage issues within the three primary watersheds in the Village: Lacey Creek, St. Joseph Creek, and Prentiss Creek, which drain to the East Branch of the DuPage River. The Plan makes recommendations directed to specific areas to improve the Village's stormwater system in terms of conveyance, storage, and quality.

Elk Grove Village (Cook Co.)

Elk Grove Village does not have a comprehensive plan or other relevant plans.

Elmhurst (DuPage Co.)

The City of Elmhurst adopted its most recent Comprehensive Plan in 2009. The plan addresses land use, transportation, economic development, community facilities and services, natural resources, sustainability, urban design, and governance. Elmhurst is a mature community largely composed of single-family neighborhoods. The Plan promotes infill development in existing neighborhoods and encourages that LEED for Neighborhood Development strategies are incorporated in neighborhood redevelopment efforts. These strategies encourage healthy living, protecting threatened species, and increasing transportation choice. The Plan emphasizes pedestrian-oriented and environmental practices throughout. Additionally, the Plan encourages transit-oriented and higher density residential development in the downtown area.

Furthermore, the Plan contains nine subarea plans, which provide recommendations for mixed-use, pedestrian friendly development or redevelopment.

In regards to transportation, Elmhurst has an extensive roadway network, commuter rail and bus transit system, and a well-connected pedestrian and bike network. The Plan supports infrastructure improvements to encourage transit usage (e.g., bus shelters) and improved routing of Pace bus service. There is a strong emphasis on alternative transportation. The Plan recommends that new commercial development or redevelopment projects facilitate pedestrian and bicycle access. The Plan also encourages "complete streets" with a complete sidewalk network, bike lanes, bike racks, and pedestrian amenities. Furthermore, the City has access to the Illinois Prairie Path and trails are currently under construction along Salt Creek which will provide connections to existing regional trails.

The Plan has a separate Natural Resources section calling for the preservation of natural resources and open space and improved access to natural resources, such as the Illinois Prairie Path, Salt Creek, the Elmhurst Great Western Prairie, and forest preserves. In addition, the Plan encourages integrating open space in new construction. Improvements for the Salt Creek Greenway include a new multi-use trail, stream bank stabilization, and a water quality demonstration project. A large area along Salt Creek is within the 100-year floodplain and a considerable portion is maintained as open space to manage flooding. The City recognizes the impact of excessive runoff from non-permeable surfaces on groundwater and outlines run-off reduction practices, along with sustainable landscaping practices, to conserve water and minimize groundwater contamination. Run-off reduction practices include bio-retention, permeable pavement, and rain gardens. In addition, the Plan supports planting urban street trees in neighborhoods and recognizes the economic and environmental benefits of trees. Furthermore, as part of the City's sustainability efforts, the plan encourages LEED principles, which include "smart location" in proximity to water and wastewater.

The Plan contains a separate Sustainability section, which not only addresses environmental sustainability in regards to climate change mitigation and energy efficiency, but it also addresses accessibility, alternative transportation, and policy. For example, the Plan supports economic development policies designed to promote sustainability, which include supporting home-based work and business activities. In addition, the Plan supports developing housing policies that encourage residents to adopt sustainable practices in their home or business. Furthermore, the City released a report in 2013, *Building a Sustainable City: Environmental Accomplishments in the Elmhurst Community*, highlighting its sustainability efforts from 2007-2012. The report is comprehensive and addresses various areas of sustainability (e.g., waste, energy, open space, biking, gardening, and education) at various scales. Lastly, the Comprehensive Plan includes an extensive Urban Design section that outlines goals and objectives that embody the concepts throughout the Plan and aim to create an aesthetically-pleasing, connected, and pedestrian-friendly community.

Franklin Park (Cook Co.)

The Village of Franklin Park adopted its Comprehensive Plan in 2005. The Plan addresses land use, economic development, transportation, infrastructure, community facilities, natural resources, and community character and design. The Plan contains an environmental element throughout. Nearly all of the land within and near Franklin Park has been developed. However, several areas have potential for redevelopment, improvement, or changes in type or intensity of land use. The Plan identifies the Martens Street area and Grand/Mannheim Commercial area as priority planning areas. Land use recommendations include developing a range of housing choices, expanding the mix of businesses, mixed-use and transit-oriented development, and redevelopment or reuse of underutilized industrial and commercial sites. Redevelopment and reuse uses the land in an efficient and environmentally friendly manner.

In addition to infrastructure upgrades to the existing road network, the Plan encourages alternative modes of transportation through transit, bicycle, and pedestrian improvements. A Metra Station exists in downtown Franklin Park and the Village aims to increase ridership through transit-oriented development. Other improvements include establishing new transit service to O'Hare Airport and provision of bus shelters. Recommended improvements to promote walking and biking include landscaping, constructing pedestrian bridges, sidewalk infill and repair, crosswalks, and dedicated bike lanes and facilities. The Plan encourages alternative transportation options as a means to protect air quality.

The Plan contains a strong environmental element, encouraging stormwater reduction techniques and green infrastructure. Similarly, the Plan promotes natural landscaping and green space in development. Specific water and natural resources are not identified, but the Plan calls for their preservation in general through many strategies. The Plan also emphasizes tree preservation as a community goal. Furthermore, the Village supports brownfield redevelopment and explicitly has principles pertaining to water quality and conservation. It calls for the adoption of "water, wetland, and floodplain protection ordinances…to prevent degradation of water quality and habitat." Lastly, the Plan encourages participation in groundwater protection efforts; Franklin Park is one of the few municipalities that mentions groundwater in its Plan.

Hillside (Cook Co.)

The Village of Hillside does not have a comprehensive plan or other relevant plans.

Hinsdale (Cook Co.)

The Village of Hinsdale does not have a comprehensive plan or other relevant plans.

Itasca (DuPage Co.)

The Village of Itasca updated its Comprehensive Plan in 2015. The Plan outlines the Village's recommendations for land use, transportation, community facilities, and parks and open space. The Plan recommends mixed-use development in the downtown by establishing a residential base that supports retail activity. It also supports that mixed-use areas "provide a vibrant, safe, attractive and 'walkable' pedestrian environment." The Plan incorporates preservation of open space and stormwater management practices throughout its land use recommendations. There are two subarea plans included in the Comprehensive Plan: Hamilton Lakes and the Central Manufacturing District (CMD). The Hamilton Lakes Subarea Plan supports a mix of office and residential development, and the CMD Subarea Plan focuses on industrial and commercial development. Both plans encourage connectivity and aesthetic improvements.

The Elgin O'Hare Western Access Project, currently being constructed, will positively impact access to the Village by improving regional mobility and promoting economic development in and around the Village. Additionally, the Plan recommends completing gaps in the roadway network and making improvements to traffic flow, site access, and overall circulation as needed. In regards to public transit, the Village is served by Metra and Pace, and the Plan encourages that these services be maintained and enhanced. The pedestrian and bicycle network is inconsistent and incomplete. The Plan recommends incorporating sidewalks, crosswalks, greenways, and multi-use paths to connect to surrounding networks and uses. Furthermore, the Plan encourages that the Village consider adopting a "Complete Streets" ordinance and a Sidewalk Gap Program to further support pedestrian and bicycle movement.

Parks and open space are a valued asset in the community, and the Village is well-served by parks and open space, including two DuPage County Forest Preserves. The Plan encourages that the Village continue to preserve and enhance its environmental features. In addition, the Village recognizes the importance of open space and natural features in facilitating stormwater infiltration. Furthermore, local stormwater detention areas and the Wood Dale/Itasca Regional Detention Project and Flood Control Reservoir serve as significant investments in stormwater management infrastructure and in mitigating flooding along Salt Creek and Spring Brook. The Plan encourages that the Village continues to explore natural methods of flood control and stormwater management, including best management practices (BMPs).

La Grange (Cook Co.)

The Village of La Grange adopted its most recent Comprehensive Plan in 2005. The Plan addresses future land use, mobility, community facilities, and economic development. La Grange is built out, so the Plan recommends infill development. It also contains a detailed subarea plan for the BNSF Railroad Corridor. The Plan encourages transit supportive redevelopment within the Corridor, with a mix of retail, service businesses, and multi-family housing.

In regards to transportation, the Plan encourages improved traffic flow on roads and alternative modes of transportation. The Plan recommends improved public transit facilities and service through Metra and Pace, along with improvements to walking and biking conditions. Amtrak also serves the Village and is the only transit service that extends beyond the Chicago metro area, providing an important service to residents. Walking and biking improvements include complete sidewalks, bicycle parking facilities, and safety measures. The Plan also recommends continuing to develop "a local bicycle system with regional continuity."

The Plan encourages that open space be maintained and enhanced. The *Open Space Master Plan*, adopted in 2000 by the La Grange Park District, is a detailed plan that prioritizes and provides recommendations for property acquisition, facility development, and park maintenance. The Comprehensive Plan encourages the protection of historic and natural resources, but neither natural or water resources are described in further detail. The Plan identifies that there are capacity issues with the Village's stormwater infrastructure. In a number of areas, sewer backups occur causing flooding. To address flooding, the Plan recommends developing a system of relief storm sewers. There is no mention of green infrastructure or best management practices (BMPs) to address flooding.

La Grange Park (Cook Co.)

The Village of La Grange Park updated its Comprehensive Plan in 2006. The Plan establishes a general vision for future development in the community and specifically addresses land use, transportation, community facilities and infrastructure, and design guidelines. La Grange Park's housing stock is primarily single-family residential, and the Plan encourages that this use be maintained and that development primarily be infill. In addition, the Plan discourages expansion of commercial area boundaries while attracting retail business and remaining economically viable. The Plan also supports that the impact of industrial businesses on residential neighborhoods be minimized through buffering. Furthermore, the Plan encourages redevelopment of underutilized or vacated properties. However, mixed-use and transit-oriented development are not included in land use recommendations.

The Plan encourages a multi-modal transportation system and recommends improvements to roads as well as to transit, pedestrian, and bicycling conditions. The Village is served by four major Pace bus routes and two Metra stations, and the Plan supports enhancing transit services and increasing ridership by working with Pace and Metra to provide bus shelters and developing a commuter transit station north of 31^{st} Street. Recommendations for pedestrian and bicycle conditions include improved facilities (e.g., lighting, street furniture, and bike racks), installing sidewalks, and improved connections. The Plan supports developing an on-street path that can link key community facilities, including the Salt Creek Trail, within residential areas. There is little opportunity for additional off-street trails because the Village's land is already fully developed.

The Community Park District maintains six parks in the Village. The Plan supports the preservation of all park district properties and increasing the supply of land available for open space and recreation if possible. It does, however, lack a natural resources and water element. Water supply is addressed, as it is a concern for the Village, but the section does not include a discussion of water resource conservation or water quality.

Furthermore, the Village adopted a Sustainability Plan in 2012 to establish a framework for future decision-making by the Village government to make sustainable choices, and thereby enhancing the quality of life of residents. The Plan outlines strategies pertaining to water, land, air, energy, and waste. Water strategies include BMPs, watering restrictions, sub-metering, and education.

Lombard (DuPage Co.)

The Village of Lombard updated its Comprehensive Plan in 2014. The Plan addresses land use, transportation, economic development, and community facilities. In regards to land use, the Plan supports mixed-use activity in the downtown. The Village is committed to sustainability and encourages the use of environmentally friendly design materials and construction techniques in new development and redevelopment. The Plan also identifies eleven "Areas of Concern" and provides a brief recommended action for each area. Recommendations are focused on reclassification of subject properties to allow for uses deemed appropriate by the Village.

The Village aims to create a multi-modal transportation network. Recommended infrastructure improvements include a "complete streets" approach to address the needs of pedestrians, bicyclists, transit users, motorists, and property owners alike. The Plan provides recommendations for general roadway improvements, public right-of-way, and access control. In regards to public transportation, the Village has access to both Metra and Pace. Lombard also has access to the Illinois Prairie Path and the Great Western Trail, and the Plan encourages developing a local system that provides connections to these regional trails.

The Plan encourages preservation of open space and protecting the natural environment, which includes pursuing additional opportunities for open space. The Plan recognizes the stormwater benefits in addition to the recreational benefits of maintaining current open space. In addition, the Village has a separate Open Space Plan (2010) that "identifies who is involved with open space, what open space currently exists, and which factors affect open space." Four park districts own property within the Village and provide parks and recreational facilities. The DuPage County Forest Preserve District also has one property (Broadview Slough) within Village limits, and two forest preserves lie in unincorporated Lombard.

The Village's Open Space Plan addresses "Special Management Areas," which include wetlands and wetland buffers, riparian areas and floodplains. The DuPage County Stormwater and Floodplain Ordinance controls development these areas and requires best management practices (BMPs) for water quality. The Open Space Plan notes that all large scale development within the County, and within Lombard, is required to both detain stormwater runoff and treat the stormwater for pollutants. Treatment methods (BMPs) include permeable pavers, green roofs, and wetland-bottom ponds. The Open Space Plan also identifies conservation easements as another tool used to preserve open space and protect the environmental value of privately-owned land by restricting its use and development. Property owners are able to receive tax benefits in exchange for donating a conservation easement to a conservation organization or government entity. Several churches in Lombard, along with some residential and commercial properties, have conservation easements. In addition, the Open Space Plan recommends that the Village should pursue annexation of certain parcels (Ken-Loch Golf Links, Fullerton Park, and York/High Ridge Forest Preserve) to ensure that these areas remain as open space.

Lastly, the Village developed a Local Climate Action Plan in 2012. In 2009, the Village signed the U.S. Mayors Climate Protection Agreement to pledge to reduce greenhouse gases by 7% below 1990 levels by 2012. Strategies to achieve this goal included:

- Reduce electrical consumption of Village operations and facilities
- Partner with ComEd to promote energy efficiency/savings programs
- Partner with the Citizens Utility Board to promote residential energy reductions
- Facilitate sustainable building practices and energy efficiency
- Promote emission-free transportation options
- Reduce waste hauling and landfilling
- Enact land-use policies that preserve open space and preserve smart growth
- Maintain the urban forest
- Educate the community about greenhouse gas emissions
- Increase fleet fuel economy by reducing idling and purchasing more fuel-efficient vehicles
- Switch to renewable energy sources

Although there were reductions in some areas, the Village's actions only reduced CO_2 emissions by 0.26%, or about 2,000 tons.

Lyons (Cook Co.)

The Village of Lyons adopted its Comprehensive Plan in 2015. The Plan provides recommendations for land use, transportation, economic development, natural environment, and community facilities and services. Lyons is primarily residential and largely built out. The Village aims to preserve existing housing stock while also meeting the housing needs of an aging population, which includes densifying and diversifying housing options through infill development or redevelopment. The Plan supports mixed-use, pedestrian friendly development near major commercial areas which are located along major traffic corridors and key intersections. Furthermore, the Plan supports the development of a town center at the intersection of Ogden Avenue and Joliet Avenue, which will be a mixed-use commercial destination. This would transform a busy, auto-oriented intersection to a pedestrian-friendly, walkable area.

The Plan supports a balanced transportation system and recommends improvements to the existing roadway network as well as to transit, pedestrian, and bicycle conditions. The Plan recommends updates and maintenance of roadways to accommodate traffic volume and improve efficiency. Lyons' residents infrequently use public transit; only one Pace bus route passes inside Lyons, and Metra does not directly serve the Village. The Plan calls for enhancing access to public transit through expanding bus service connections. In addition, the Plan encourages development of pedestrian and bike facilities, sidewalk improvement, and expansion of the Village's trail network in an effort to promote walking and biking.

The Plan has a separate natural environment section that recommends preservation of natural resource amenities, expansion and improvement of open space, and better connections between open space. The Des Plaines River, and the acres of preserved land that surround it, have shaped the image and character of Lyons. The river has, however, experienced flooding. In addition to upgrading stormwater infrastructure, the Plan supports installation of green stormwater infrastructure and innovative design elements such as native plantings, community gardening beds, and drainage swales. Lastly, the Village promotes participation in a rain barrel program which is part of the Metropolitan Water Reclamation District's (MWRD's) green infrastructure initiative to help municipalities with managing stormwater and reducing water pollution.

Maywood (Cook Co.)

The Village of Maywood updated its Comprehensive Plan in 2014. The Plan outlines the Village's vision for land use, transportation, environmental features, community facilities, and community image. Recommendations for land use include building high-density, mixed-use development along 5th Avenue and 19th Avenue surrounding the Metra stations. In addition, the Plan addresses brownfield redevelopment and encourages establishing a Village-wide remediation program that prioritizes investment in brownfield clean-up.

In addition to roadway improvements, the Plan supports investing in streetscaping, sidewalk improvements, bicycle trails, and bicycle parking to encourage walking and biking as alternative modes of transportation. It also promotes better connectivity to the Cook County Forest Preserves and Illinois Prairie Path. The Plan recommends that Maywood also support the Transportation Alternative Program and the Safe Routes to School Program which provide funding for various infrastructure-related projects. Furthermore, the Plan recommends improvements to Metra, Pace, and the CTA. One CTA bus route runs through Maywood, and the CTA Blue Line terminates just east of Maywood in Forest Park. A feasibility study is in process to determine the potential extension of the Blue Line to Mannheim Road.

The Plan contains a separate Open Space & Environmental Features section which identifies the Village's parks, forest preserves, and the Des Plaines River. The Plan calls for preservation of the Des Plaines River, Village tree canopy, and other important natural features. The Plan supports some innovative concepts, such as focused lighting fixtures that reduce upward light pollution from I-290, and vibration dampening barriers to minimize the environmental impacts of traffic. Although few properties are impacted by flooding, the Plan supports prohibiting new development within existing floodplains and suggests working with property owners to mitigate floodplain hazards through on-site stormwater detention and filtration. Sustainable development practices, such as stormwater filtration, renewable energy sources, green building standards, use of native landscaping, and recycling are also included as recommendations. For example, it calls for utilization of stormwater best management practices (BMPs) in streetscaping.

Melrose Park (Cook Co.)

The Village of Melrose Park adopted its Comprehensive Plan in 2001. The Plan outlines the Village's vision for land use, transportation, environmental areas, and community facilities. Melrose Park is a mature, primarily residential community with a stable commercial component and strong industrial base. The Plan recommends that zoning allows for mixed-use development along 5th Avenue and 19th Avenue, surrounding the Metra Station. The Plan contains three corridor improvement recommendations for the North Avenue Corridor, Lake Street Corridor, and Broadway Avenue Business District. Recommendations are provided for use and development, parking and circulation, urban design, and site maintenance. In addition, the Plan describes ten priority redevelopment/improvement sites. The Village also aims to physically enhance and improve areas of the Village in order to promote a sense of community and pride.

The Village has a well-established network of road, rail, and mass transit services. The plan promotes a balanced transportation system that ensures the safe and efficient movement of vehicles, pedestrians, and bicyclists alike. The Village is currently served by nine Pace bus lines and the Union Pacific/West Metra line. Along with street improvements and traffic management, the Plan recommends improved rail and bus service to meet future demands. Furthermore, the Plan recommends developing a connected pedestrian and bicycle system. Specific improvements may include safe design of street intersections, street lighting, and surface conditions.

The Plan encourages that the local public park system be maintained and locations for new open space are established. The Plan identifies and describes four primary environmentally sensitive areas within Melrose Park – Des Plaines River, Cook County Forest Preserve, Silver Creek, and Addison Creek – and supports that they be protected and enhanced. Furthermore, the Plan recognizes the role of these areas in natural water filtration, stormwater holding, and flood control management. The Plan outlines strategies for improving these areas in regards to habitat quality and also as components of the larger stormwater management system. It also promotes watershed-based planning, stream protection, soil erosion and sediment control, stream maintenance and streambank protection, and use of native vegetation as strategies to improve environmentally sensitive areas.

Northlake (Cook Co.)

The City of Northlake adopted its Comprehensive Plan in 2013. The Plan addresses land use, transportation, environmental features, governance, and community services. The City is built-out, so the plan focuses on redevelopment and infill development, along with mixed-use development at major intersections (North Avenue and Wolf Road) and along commercial corridors. Although the City's housing stock is primarily single-family, the Plan recommends a mix of housing options to support "aging in place." The City also aims to attract quality businesses and collect data on industrial properties to potentially cleanup and reuse brownfield properties. Furthermore, the Plan encourages innovation and improved energy efficiency in businesses.

Northlake is located close to the Interstate system, major arterials, O'Hare International Airport, and rail transit. The Plan aims "to create a multi-modal transportation system that improves the roadway network while strengthening the use of transit, bicycling, and walking." Desired roadway improvements include improved traffic flow along North Avenue and installing direct access from I-294 (southbound) to North Avenue (eastbound). To expand public transit, the City will work with Pace bus service. Pace provides service along the major corridors within Northlake, but it is not used by a majority of residents. New redevelopments, encouraging local businesses to use transit, and exploring different types of bus services may increase ridership. Pedestrian and bicycle improvements include installing pedestrian features (e.g., lighting, paved crosswalks, and wayfinding signage) and expanding upon the existing trail network.

The Plan provides a detailed overview of the City's existing environmental features. These include parks and open space and Addison Creek. The City aims to maintain existing parks and acquire open space to create new park sites. The City also recognizes that its decisions regarding waterways affect communities downstream and it recognizes the role of open areas in stormwater management. Addison Creek has flooding and water quality issues; in order to address these issues, the City, Veterans Park District, and Memorial Park District have led initiatives aimed at improving the natural infrastructure along the creek. Initiatives include dam removal and returning the creek to a natural flow. Northlake also worked with the Metropolitan Water Reclamation District (MWRD to decrease erosion along the creek's banks and reduce the size of the floodplain area. The Plan recognizes green infrastructure and stormwater BMPs as means to deal with future flood issues.

North Riverside (Cook Co.)

The Village of North Riverside does not have a comprehensive plan or other relevant plans.

Oak Brook (DuPage Co.)

The Village of Oak Brook's Comprehensive Plan was last amended in 1990. The Plan promotes preservation of the low density and open space character of the Village and includes special use housing considerations to provide for single-family residential development. It promotes that offices be located near principal arteries and commercial areas be accessible by all forms of transportation.

Along with roadway improvements, the Plan recommends developing interconnected footpaths, bicycle trails, and sidewalk systems. It also encourages more people to ride in each vehicle and greater utilization of pedestrian and bike pathways, which will lessen the pressure for widening roadways. Widening is discouraged, especially in residential areas. In addition, the Plan promotes locating schools in easily accessible areas and providing necessary safety precautions to allow children safe and protected trips to and from school. The Comprehensive Plan notes that the Village has a formal bicycle and pedestrian master plan, but it needs to be updated. Furthermore, the Plan encourages the use of public transit and improved bus service to reduce vehicular traffic volume.

The Plan has a strong preservation element. Open space is one of Oak Brook's greatest assets. The Village has several parks owned by Oak Brook Park District, two major private golf courses, and two DuPage County Forest Preserves within or near the Village. The Plan supports that the Park District be guaranteed the first opportunity to acquire the few large tracts of land left in the Village. The Village recognizes the role of parks and open space in minimizing flooding, and the Plan recommends that floodplains be preserved as open space and future development be controlled in the floodway fringes. In addition, the Plan supports building retainage areas to protect the Village from possible damage by increased urban runoff. Furthermore, the Plan promotes the use of trees and landscaping along streets and in parking lots to enhance the aesthetics of the Village. Lastly, the Plan encourages that developers of commercial and industrial structures include more green areas and landscaping.

Oakbrook Terrace (DuPage Co.)

The City of Oakbrook Terrace updated its Comprehensive Plan in 2007. The Plan addresses land use, transportation, parks and open space, community facilities, and urban design. The Plan supports appropriate infill development to accommodate new development. In addition, it promotes a balanced pattern of development with a healthy and mutually reinforcing mix of commercial, retail, and service uses along certain corridors. The Plan includes eight distinct City Planning Units comprised of areas within the City and provides recommendations for land use, transportation, and urban design.

The Plan encourages "a balanced transportation system, which ensures the safe and efficient movement of vehicles, pedestrians and cyclists." Roadway improvements include widening of major roads and traffic operational measures to better accommodate traffic. Recommended improvements to bicycle and pedestrian conditions include expanding the City's trail system by building upon the Spring Creek Tributary Trail and improving access to the Salt Creek Greenway and other park sites. The Plan also recommends streetscaping and urban design improvements including lighting, landscaping, pedestrian amenities, and gateway signage. There are four Pace bus routes that serve Oak Brook Terrace, but recommendations to improve public transit are not noted.

The Plan identifies the City's parks and open spaces and encourages that natural features – topography, watercourse, floodplains, woodlands, and wetlands – be respected, but further detail and preservation measures are lacking. The City recognizes that acquiring new open space is needed to meet the needs of the community, and the Plan's objectives are geared primarily towards the recreational aspect of open space. The Plan recommends landscaping of streets and parking lots "to avoid large expanses of asphalt…," and planting regularly spaced street trees along both sides of the street as part of the Plan's design guidelines, but such guidelines are in place primarily for aesthetic purposes rather than for stormwater management. Lastly, the Plan promotes that open spaces and courtyards be promoted as part of private development projects.

Roselle (Cook Co. and DuPage Co.)

The Village of Roselle updated its Comprehensive Plan in 2016. It addresses land use, transportation, and natural resources. Roselle is a mature and significantly built-up community, so the Plan focuses on maximizing redevelopment of underutilized land in already built-up areas. It also recommends expanding the Irving Park Road Metra station area to create a stronger transit oriented town center. The Plan includes five subarea plans that contain similar themes of mixed-use, pedestrian friendly development.

There is no Pace fixed-route transit service in Roselle, but Dial-A-Ride is available to address the unmet travel needs of seniors and persons with disabilities. Roselle is served by three Metra stations, but the Plan recommends better connectivity to them to allow for walking or bicycle access. It also supports transforming Irving Park Road and Roselle Road into multimodal pedestrian and bike friendly streets. The Village has access to multiple municipal and regional trails, and the Plan supports creating a connected trail system that links residential areas to major activity centers. Furthermore, the major arterials in the Village are included in Pace's long term strategic plan, contingent upon first establishing transit supportive land uses.

The Plan promotes that the Village strengthens existing open spaces and preserves natural areas. The Plan encourages open space development at the Village Square, Irving Park Road and Maple Avenue, I-390, and North Roselle Road Corridor. It also promotes enhancing Medinah Wetlands. The Village is served by four park districts and has major open space anchors including Turner Park and Meacham Grove Forest Preserve. Many of Roselle's existing parks were originally planned to serve as stormwater detention or retention areas and continue to fulfill that role today. The Plan recommends that the Village undertake a stormwater management plan to determine if current parks are sufficient to meet the regulatory needs of the DuPage County Stormwater Ordinance and to determine where new stormwater facilities might need to be built to support new development. In addition, the Plan incorporates stormwater detention, open space, landscaping, and buffering into designs for subarea plans.

Schaumburg (Cook Co. and DuPage Co.)

The Village of Schaumburg updated its Comprehensive Plan in 1996. It addresses land use, economic development, transportation, natural amenities, and design guidelines. There is limited space for new development, so the Plan promotes infill development and adaptive reuse. Single-family development is preferred for infill development to preserve and maintain the character and congruity of existing single-family neighborhoods. The Village does, however, have a strong mix of housing types. Also, the Plan encourages mixed-use development in the Regional Center, the Irving Park Road Region, and the Community Center.

Schaumburg is infamous for traffic. The Plan recommends focusing improvements along the highways and regional corridors. The Village does recognize that relying solely on automobile transit is detrimental to the environment and community. Pace has been making improvements to the Village's bus system, and the Village also adopted the Year 2000 Bikeway Plan in 1993. A contiguous pedestrian and bicycle circulation system along with safety initiatives will encourage the use of sidewalks and bikeways. The Village also hosts a Metra commuter rail facility and supports an alternative transit system, such as Personal Rapid Transit, a monorail system that can carry up to four individuals in their own car and allows them to program their destination on a set course. Other suggestions include employee commute options to accommodate flexible schedules, compressed work weeks, car pools, and other incentives for employees to change their commuting habits. In 2008, the Village adopted an amendment to the Plan to incorporate transit-oriented development for the area around the Suburban Transit Access Route (STAR). STAR is a proposed rail line that would connect nearly 100 communities in the northwest suburbs.

The Plan has a strong preservation element. Given that Schaumburg is reaching full development, focus is placed on maintaining and enhancing the sites that have already been preserved. The Plan encourages limiting development on unstable lands and wetlands and maintaining significant tree stands. Also, the Village has a Wetland Protection District that protects people from potential geological and hydrological hazards, prevents degradation of land and water, and ensures development enhances the natural topography, resources, amenities, and fragile environment of wetlands. The Plan suggests land banking as a technique to preserve wetlands. Similar measures apply to the Village's floodplains and open space. In addition, the Village has adopted Tree Preservation, Landscaping, and Screening Requirements into its Zoning Ordinance to protect those trees that are not in a preserve. In 2004, the Village adopted an amendment to the Comprehensive Plan to incorporate the Chicago Wilderness Biodiversity Recovery Plan. Using the directives from the Biodiversity Recovery Plan, design guidelines for properties with desirable natural amenities were adopted by the Village board to ensure the preservation of these areas.

Furthermore, in 2008, the Village adopted a Comprehensive Green Action Plan (C GAP), which focuses on programs that will strengthen the Village's commitment to the environment. It addresses setting a CO_2 baseline, land use and transportation policies, green power, energy efficiency, green buildings, water management and conservation, recycling and waste reduction, education and outreach, and funding opportunities.

Stone Park (Cook Co.)

The Village of Stone Park does not have a comprehensive plan or other relevant plans.

Villa Park (DuPage Co.)

The Village of Villa Park updated its Comprehensive Plan in 2009. The plan addresses land use, transportation, community facilities and utilities, economic development, and historic preservation. The Village's residential areas are well-established, so infill development and rehabilitation is recommended in these areas. The Plan recommends transit-oriented, mixed-use development near the Village's Metra station, business districts, and commercial corridors. The Plan also contains Special Corridor Plans pertaining to specific areas in the Village – North Avenue Corridor, St. Charles Road Corridor, and Roosevelt Road Corridor – which involve recommendations for enhancing existing commercial/retail business, mixed-use development, and streetscaping.

Villa Park recognizes the importance of promoting alternative modes of transportation to reduce greenhouse gas emissions. Nonetheless, the Plan does recommend roadway improvements to improve traffic flow, such as opening up Madison Street to IL-83 and the use of roundabouts. Metra provides service to Villa Park on its Union Pacific West Line, are there are three fixed Pace bus routes through the Village. The Plan promotes public transit investments, service expansions, and other transportation alternatives (e.g., a trolley). There are also three significant pedestrian/bike paths: the Great Western Trail, the Illinois Prairie Path, and the Salt Creek Greenway Trail. The Plan recommends developing a comprehensive path network that connects major activity nodes and traverses all major neighborhoods, which would consist of on- and off-street routes, bike racks, signage, lighting, and crossings. The Plan also encourages complete streets for all streets in the Village.

There is not a separate chapter dedicated to open space and natural resources, but the Plan proposes some innovative initiatives. Major parks include Lions Park, Lufkin Park, Rotary Park, and Twin Lakes Park. However, the Village recognizes that more open space needs to be allotted in the future to meet the recreational needs of residents. Therefore, the Plan recommends creating an interconnected system of parks and public green spaces. The Plan encourages that Village Park be a "sustainable community," which includes being considerate of the environment. In addition, the Plan encourages protecting environmentally sensitive lands and natural resources in the Village, which include ponds, streams, wetlands, and floodplains. This can be accomplished by establishing open space buffers around waterbodies, restricting new development in wetlands and floodplains, creating green corridors/linkages among these areas, and expanding existing parks and establishing new ones. The Comprehensive Plan notes that Villa Park adopted the DuPage County Stormwater Ordinance and is working to correct stormwater drainage problems in redevelopment. The Plan encourages the use of street trees and ecologically sustainable landscaping along public rights-of way and permeable paving for all new alleys, sidewalks, and parking lots. Other sustainable initiatives that the Village sets forth include utilizing LEED standards, retrofitting in building design and construction, and setting targets and strategies for becoming carbon neutral.

Westchester (Cook Co.)

The Village of Westchester updated its Comprehensive Plan in 2014. The Plan lays out the Village's vision for future land use, transportation, and the natural environment. It encourages mixed-use development in retail districts to create more compact, walkable, and attractive areas. Mixed-use developments will also provide a greater variety of housing options that help retain existing residents and attract new ones. In addition, the Plan supports development of infill sites which require minimal infrastructure investments, do not strain municipal services, and have a low environmental footprint.

The Plan supports a multi-modal transportation system that enables the daily use of transit, bicycling, and walking. Although it provides recommendations for improved vehicular conditions, including traffic-calming features and street rehabilitation, the Plan also recommends enhancing existing Pace and Metra transit services. In addition, the Plan recommends creating better bike connections throughout the Village and expanding current bike infrastructure. Furthermore, the Plan supports developing ordinances that serve to protect pedestrians and bicyclists, along with implementing several initiatives such as Safe Routes to School and Safe Routes for Seniors.

Flooding is a major concern in Westchester. Two areas in Westchester are within the 100-year floodplain: residential areas on the north side along Addison Creek and a tributary of Salt Creek a few blocks north of 31st Street. The Plan recommends implementing best management practices to reduce stormwater runoff including bioswales, pervious pavements, and rain barrels. Nearly a quarter of the community is dedicated to open space. However, access to open space and the distribution of open space throughout the community are key issues. The Plan recommends creating a parks and open space master plan to help address such issues and identify opportunities for creating additional open space.

Western Springs (Cook Co.)

The Village of Western Springs updated its Comprehensive Land Use Plan in 2003. The Plan provides recommendations for land use, transportation, and community facilities. The Village is mostly built out, so "any significant land use changes will likely occur as redevelopment of already developed areas." Although the Village strives to maintain its character as a single family residential community, the Plan does encourage higher density, mixed-use development by recommending the development of housing in the upper story units in the downtown area. The Plan contains a subarea plan for the downtown which addresses: 1) the geographic configuration and extent of the downtown commercial area, 2) land use considerations, 3) off-street parking, 4) downtown design and aesthetics, and 5) two-family dwelling and municipal/institutional land uses extending east and west of the downtown area. It also provides land use recommendations for the Southern Unincorporated Area.

Regarding transportation, the Plan recommends street system improvements that address roadway conditions and increase safety and levels of service. The Village is a pedestrian friendly community, allowing for ease of walking and biking in most parts. The Plan encourages safe crossing points, additional bike routes and connections, and complete sidewalks to extend walkability to other parts of the Village. Lastly, the Village is well served by public transit and has access to Metra and Pace bus. Improvements to public transit include constructing a new commuter station, reconstructing commuter platforms, and constructing new underpasses under the BNSF/Metra railroad tracks.

Although the Village's parks are mentioned as part of the Community Facilities section, and the Plan recommends expanding open space as well as providing better connections to parks and open space (e.g., Bemis Woods Forest Preserve), there is no further discussion of natural or water resources.

Westmont (DuPage Co.)

The Village of Westmont updated its Comprehensive Plan in 2013. The Plan addresses land use, transportation, community facilities, and parks and open space. Westmont is nearly built-out, so the Plan encourages infill development or redevelopment. The Plan recommends mixed-use development in the downtown area to help foster an active downtown. Furthermore, the Plan contains four subarea plans (Ogden Avenue, Downtown, Naperville Road and Cass Avenue, and 63rd Street and Cass Avenue). Each subarea plan includes recommendations for land use, access, and image/identity.

The Plan not only aims to improve the safety and efficiency of vehicular movement within the Village, but it also supports establishing "a coordinated bicycle and pedestrian network that links neighborhoods, shopping areas, employment centers and community facilities." Infrastructure improvements to develop a bicycle and pedestrian network include connecting local paths to the Southern DuPage County Regional Trail, expanding existing trails and sidewalks, bike lanes, streetscaping, and safety improvements. The Village has access to the BNSF and Pace bus service, and the Plan recommends improvements to public transit to ensure that it continues to serve the community. Such recommendations include coordinated scheduling and employer incentives for transit use.

The Plan's Parks, Open Space, and Environmental features section addresses many elements. The Village supports the Westchester Park District in creating a comprehensive parks and open space master plan and aims to work with the Park District to identify potential park locations in underserved areas. The Plan also encourages preservation of the natural environment, including water quality, and that the impact of new development on natural resources be minimized. There are four drainage watersheds within the Village, including Salt Creek. To protect these watersheds, the Plan encourages infiltration-based hydrology and stormwater management practices. The Plan also suggests that the Village works with property owners and developers to minimize the amount of impervious surface created by new development and to protect environmentally sensitive areas (e.g., floodplains, wetlands, and mature tree stands). Lastly, the Plan encourages that the Village use local infrastructure as a tool for environmental conservation by promoting green infrastructure, sustainable design, and best management practices (BMPs) to address flooding.

In addition, The Village adopted a Stormwater Master Plan in 2009. The Stormwater Master Plan addresses the four main watershed regions in the Village and identifies flooding sources and stormwater infrastructure inadequacies. Based on evaluation, the Stormwater Master Plan recommends solutions for each of the four watershed areas.

Wood Dale (Cook Co.)

The City of Wood Dale updated its Comprehensive Plan in 1997. The Plan focuses heavily on development and traffic management. Wood Dale is a mature community, so new development is limited. The Plan promotes development of vacant, buildable land but also redevelopment of underutilized properties in commercial and residential areas. It encourages mixed-use development in the town center "to provide higher density housing, local shopping, entertainment and civic and cultural activities in a unified, pedestrian oriented environment." In addition, the Plan contains a Special Areas Plan for the town center and Irving Park Road.

The City recognizes air quality as a major environmental issue and the need to provide pedestrian and bicycle routes as a way to address this issue. Recommendations for improved pedestrian and bicycle conditions include safety measures including mid-block crossings, flashing caution lights, and continuous sidewalks. The Plan does also recommend road widening in some places – Wood Dale Road and Elizabeth Drive – to allow for better vehicle traffic flow. Regarding public transportation, the Plan recommends contacting Pace regarding service area expansion.

The Plan does not contain a section dedicated to environmental features, but it encourages preservation of environmentally sensitive lands, which include wetlands, floodplains, woodlands, and prairies. The Plan supports enhancing the Salt Creek corridor with flood control features and landscaping to create a high quality greenway and recreational area. It also supports limiting development in floodplain areas. Furthermore, the Plan recommends establishing additional stormwater management facilities, but green infrastructure is not included as a recommended practice. Lastly, the City has an identity as a "tree" community. The Plan calls for a city-wide tree maintenance and planting program.

In addition, in 2003, the City adopted a Comprehensive Plan Supplement which provides a vision for future land use, redevelopment, and physical enhancement of property along the City's major corridors of Irving Park Road and north Wood Dale Road. Changing conditions warranted re-evaluation of certain land use policies and redevelopment objectives. The Plan encourages mixed use, transit-oriented development along the study corridor, which is consistent with the 1997 Comprehensive Plan, as well as redevelopment of incompatible industrial sites and improved pedestrian circulation. Salt Creek passes through the study area, but the Plan provides no recommendations pertaining to it. Along West Irving Park Road, the Plan encourages increasing the visibility of Salt Creek by improving the floodplain as a natural feature and public amenity. The Plan Supplement also establishes an economic development strategy and capital improvement projects to implement its recommendations.

Cook County

In January 2015, Cook County released Planning for Progress, its Consolidated Plan and Comprehensive Economic Development Strategy for the next five years. The Plan is the County's strategic plan to marshal existing funds, gather resources, and facilitate partnerships to meet future housing, community, and economic development needs. The Plan largely focuses on infrastructure, business, housing development, transportation, and services.

Furthermore, the County adopted a Hazard Mitigation Plan in 2014, which addresses flooding. According to the Plan, a hazard flooding event is likely to occur within 25 years, impacting people, property, and the economy. The Plan contains a detailed list of mitigation measures that fall into four categories: manipulating the hazard, reducing exposure, reducing vulnerability, and increasing response capability. Manipulating the hazard includes implementing structural flood controls (e.g., levees) and low-impact development. Reducing exposure involves locating critical facilities outside the hazard area and maintaining or acquiring open space. Reducing vulnerability involves improvements in infrastructure. Lastly, increasing response capability includes producing better hazard maps, developing a public information strategy, and enforcing the National Flood Insurance Program.

Also in 2014, the County adopted a Stormwater Management Plan in response to the large number of local stormwater problems. The Plan includes the development of Detailed Watershed Plans (DWPs) and the implementation of stormwater projects intended to address critical erosion and/or overbank flooding along regional waterways.

Forest Preserves of Cook County

The Forest Preserves of Cook County (FPCC) has a Natural and Cultural Resources Master Plan, adopted in 2014, which details the elements, threats, and future goals for preserving the County's designated forest preserves. The FPCC aims to maintain and restore the health of the County's waterways by working with various organizations (e.g., MWRD, Openlands, and Friends of the Chicago River) and creating opportunities for volunteer cleanups. In addition, the FPCC supports the Green Infrastructure Vision of a healthy, connected network of natural areas, which provide clean air, clean water, flood control, and recreation. Furthermore, the Plan recognizes the need to address water quality issues from stormwater runoff to protect habitats. Stormwater runoff is one of the primary issues facing the Forest Preserves of Cook County and it is a major source of water pollution. Dam removal and erosion control measures are recognized as two methods to improve water quality. Preserving open, natural areas will also help to improve water quality by absorbing excess flood water.

DuPage County

DuPage County adopted a Land Use Plan in 1990. Its main focus is on development and it contains various draft plan maps for clusters, along with data tables with details of each site within these clusters. The Plan does contain a land use map depicting open space and it also contains a policy calling for the protection of environmentally sensitive areas (including floodplains and wetlands), but it does not contain a separate parks and open space or natural resources section.

DuPage County's Stormwater Management Plan, adopted in 1989, sets minimum countywide standards for floodplain and stormwater management. The plan has six guiding principles, including:

1. Reduce the existing potential for stormwater damage to public health, safety, life and property.
2. Control future increases in stormwater damage within DuPage County and in areas of adjacent counties affected by DuPage County drainage.
3. Protect and enhance the quality, quantity and availability of surface and groundwater resources.
4. Preserve and enhance existing aquatic and riparian environments and encourage restoration of degraded areas.
5. Control sediment and erosion in and from drainage ways, developments and construction sites.
6. Promote equitable, acceptable and legal measures for stormwater management.

In addition, the County adopted a Stormwater and Flood Plain Ordinance in 2013. The Ordinance is described in Section 3.7.4.

In 2001, the County developed the Salt Creek Greenway Master Plan. The Salt Creek Greenway Trail is a regional pedestrian/bicycle trail nearly 25 miles long that runs parallel to the creek. It passes through the communities of Elk Grove Village, Itasca, Wood Dale, Villa Park, Oakbrook Terrace, Oak Brook, La Grange Park, Westchester, North Riverside, Brookfield, Riverside, Lyons, and Hinsdale. It also passes through portions of unincorporated Addison and York Townships. The Greenway was intended to improve connectivity between municipalities as well as protect the lands surrounding Salt Creek from development.

Furthermore, in 2006, DuPage County adopted an Environmental Policy to provide guidelines for improving environmental quality. The Policy provides recommendations for air quality, land management and uses, water quality, and energy use. The Environmental Commission is tasked with periodically reviewing the County's sustainability efforts and identifying new areas for consideration.

DuPage County Forest Preserve District

The DuPage County Forest Preserve District has a Strategic Plan (2014) but it focuses on the organization and operations of the forest preserve district rather than natural resource elements and preservation.

Greenest Region Compact (GRC)

The Greenest Region Compact (GRC1), launched in 2007 by the Metropolitan Mayors Caucus, is a comprehensive sustainability guide expected to coordinate community efforts across the region. The Greenest Region Compact 2 (GRC2) was then adopted in 2016 as an update to the original Compact. It is based on 30 local and nine regional or national sustainability plans. Forty-nine consensus sustainability goals were extracted from these plans to create the Compact. The goals pertain to climate, economic development, energy, land, leadership, mobility, municipal operations, sustainable communities, waste and recycling, and water. The Compact also provides a detailed framework of possible objectives and strategies from which a municipality can create a plan tailored to its needs. A table can be found in Appendix XX which shows the sustainability achievements of communities in the study area. These achievements were used to help develop the GRC goals.

GRC1 Adopters	GRC2 Adopters
Addison	Brookfield
Bloomingdale	Franklin Park
Brookfield	Northlake
Hinsdale	Schaumburg
Itasca	
LaGrange Park	
Lombard	
Northlake	
Oak Brook	
Oak Brook Terrace	
Roselle	
Schaumburg	
Villa Park	
Wood Dale	

3.6.2 Local Ordinances

Through ordinances and codes, communities implement the vision established in their comprehensive plans by establishing detailed, enforceable regulations. Zoning is the most common ordinance that municipalities and counties use to direct land use, transportation, and development practices, with many also using subdivision, stormwater, water use, and parking ordinances to regulate specific aspects of development. *[Note: DuPage County and select municipalities within the planning area have been asked to complete a questionnaire (Appendix x) assessing the extent to which their ordinances address issues related to water quality and natural resources. The questionnaire asks whether current codes fully, mostly, minimally, or do not address stormwater drainage and detention, soil erosion and sediment control, floodplain management, stream and wetland protection, natural areas and open space, conservation design, landscaping, transportation, parking, water efficiency and conservation, and pollution prevention.]*

3.6.3 Conservation Easement Programs

A conservation easement is a land protection tool that allows private and public property owners to preserve their land from inadvertent or intentional destruction of desired natural, scenic, historic, or agricultural characteristics. Restrictions placed in a conservation easement are tailored to each property and situation. For example, the easement may require the land to remain in a natural, undisturbed condition or it may allow some limited use, such as farming or timber management. Easements can be placed on all or a portion of a landowner's property. For example, a stream and a prairie buffer along it could be specified in the easement, thereby allowing the remainder of the property to be developed. A conservation easement is permanent and is recorded like any other title interest, and stays with the land when it is transferred by sale, gift, or bequeath. A conservation easement may provide income, estate, and/or property tax benefits as well.[59] Conservation easements are typically not open to the public. Entering an area that is not open to the public subjects an individual to possible sanctions for trespass.

Organizations with which Lower Salt Creek planning area landowners can work to establish conservation easements include The Conservation Foundation (TCF), the Natural Land Institute, and the Illinois Nature Preserves Commission (INPC). Where there are high quality natural areas and habitats of endangered or threatened species, dedication or registration of such lands as an Illinois Nature Preserve, Land and Water Reserve, or Illinois natural heritage landmark can be made through the INPC.

Data from the National Conservation Easement Database indicate that there are 15.7 acres of land preserved through conservation easements within the Lower Salt Creek planning area. These easements are listed in Table 45; all are held by the Forest Preserve District of DuPage County (FPDDC). All conservation easements in the planning area are closed to the public.

Table 45. Conservation easements in the Lower Salt Creek planning area.

Site Name	*Owner*	*Easement Holder*	*GIS Acres*
Cricket Creek	Private	FPDDC	0.6
Cricket Creek	Private	FPDDC	0.4
Salt Creek Marsh	Private	FPDDC	3.0
Salt Creek Greenway	Private	FPDDC	1.2
Salt Creek Greenway	Private	FPDDC	0.1
Westmont Park District	Private	FPDDC	5.0
Wood Dale Grove	Private	FPDDC	4.0
Fullersburg Woods	Private	FPDDC	0.5
Songbird Slough Forest Preserve	Private	FPDDC	1.0

[59] http://www.conservemc.org/what-we-do/preserve-land/conservation-easements.html

3.6.4 Road Maintenance Jurisdictions

While public roads are an essential component of the built environment, a significant amount of polluted stormwater runs off these surfaces and is conveyed along transportation corridors, either through underground stormwater conveyances or road side ditches. The vehicles that travel these roads are one source of pollutants (e.g., petroleum products, tire dust, heavy metals, etc.), as are winter deicing materials, most notably chlorides in road salt. Higher traffic volumes generally increase the amount of pollutants generated from public roads and also increase the likelihood of more intense winter maintenance activities (e.g., plowing and salting). A particular concern to surface waters and roadside vegetation is chlorides in road salt, due to its adverse impacts on aquatic organisms and both terrestrial and aquatic plant community composition.

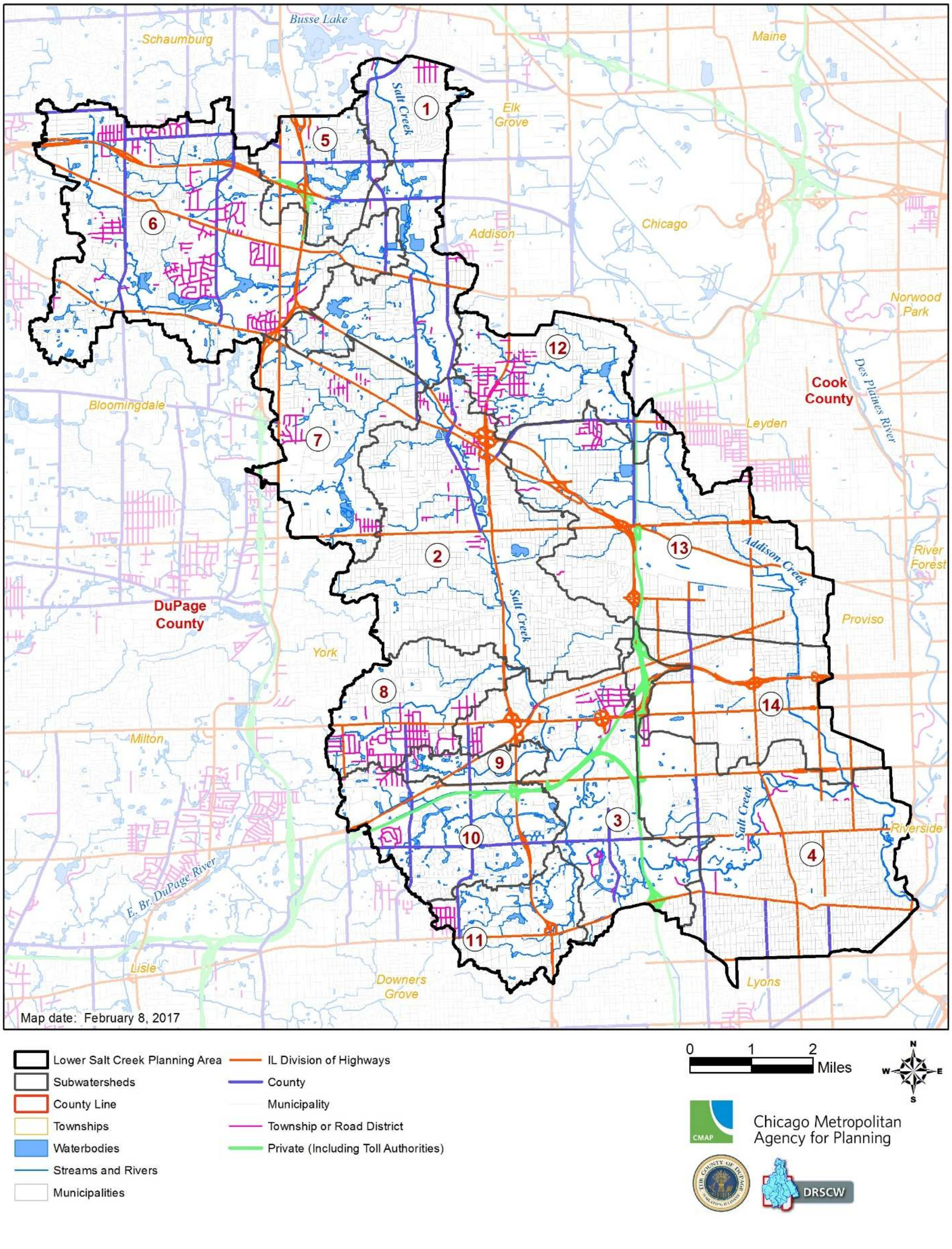
There are approximately 3,308 lane miles (1,392 road miles) within the Lower Salt Creek Watershed (Table 46, Figure 42). The traffic volumes of these roadways vary, as does the maintenance and pollutant loads generated. In addition to these public roadways, many other public and private entities maintain a vast network of roads, parking lots, sidewalks, and driveways.

Table 46. Lane miles by maintenance jurisdiction.

Subwatershed		*Lane Miles by Maintenance Jurisdiction*					
#	*Name*	*IL Div. of Highways*	*County*	*Municipal*	*Private (incl. Toll Authority)*	*Twp. or Road Dist.*	*Totals*
1	Salt Crk North	11.85	33.48	154.66	0	6.62	**206.61**
2	Salt Crk Central	63.42	10.69	381.16	0	10.74	**466.01**
3	Salt Crk South	57.31	12.80	115.41	39.62	17.16	**242.30**
4	Salt Crk Southeast	83.19	11.67	338.75	34.26	5.86	**473.73**
5	Devon Ave. Trib.	32.34	13.51	69.84	3.37	1.32	**120.38**
6	Spring Brook Crk	89.06	35.7	223.62	0.76	58.11	**407.25**
7	Westwood Crk	44.64	3.05	117.43	1.04	12.27	**178.43**
8	Sugar Crk	16.34	2.07	79.13	0	26.28	**123.82**
9	Oak Brook Trib.	6.81	3.74	15.69	0	3.49	**29.73**
10	Ginger Crk	28.15	25.63	97.28	23.26	7.36	**181.68**
11	Bronswood Trib.	18.46	3.3	56.07	0	4.81	**82.64**
12	Addison Crk North	29.33	5.15	77.01	6.61	21.43	**139.53**
13	Addison Crk Central	97.54	10.26	306.93	21.55	7.61	**443.89**
14	Addison Crk South	68.59	3.16	137.77	0.18	1.82	**211.52**
	Totals	**647.03**	**174.21**	**2170.75**	**130.65**	**184.88**	**3307.52**

Typical roadway maintenance activities include street sweeping and catch basin cleaning; road surface maintenance; underground stormwater infrastructure repair, surface drainage (ditch) maintenance, roadside grass and weed control, and litter and road kill removal. These maintenance activities can help reduce and control the amount of pollutants, such as sediment and associated metals and nutrients, which are carried with stormwater. Routine street sweeping and catch basin cleaning are particularly important maintenance activities that remove pollutants that accumulate on public roads and in the stormwater conveyance systems before reaching nearby surface waters.

Figure 42. Roads by maintenance jurisdiction in the Lower Salt Creek planning area.



3.6.5 Community Water Supply Wells, Setbacks, and Groundwater Restricted Use Areas

Municipalities or counties served by community water systems (CWS) are subject to the Illinois Groundwater Protection Act (IGPA; P.A. 85-0863).[60] Presently, 18 of the municipalities within the Lower Salt Creek Watershed planning area have CWS wells. Collectively, there are 89 CWS wells with 16 located in unincorporated areas. Municipalities with the most wells are the Village of Addison with eight, and Oak Brook and Wood Dale each with seven. Elmhurst and Villa Park each have six wells, and the Village of Roselle and Village of Bellwood each have five wells (Table 47, Figure 43).

Of the 89 wells that existing in the watershed planning area, 45 have been abandoned, eight are inactive, and two are proposed. The two proposed wells are for the North Regional Water Facility (North) and the York Township Water System (South). The remaining 37 wells are active, presumably for emergency backup, which is the case for the Village of Addison. Wells that are maintained for emergency backup are required to comply with EPA's water supply standards.

The IGPA requires that a minimum setback zone be established around all CWS wells in order to minimize aquifer contamination potential by restricting certain land-use activities. The setback zone is set depending on the sensitivity of the aquifer to possible contamination, either a minimum of a 200 foot radius for wells finished within a confined aquifer or a 400 foot radius for wells finished within an unconfined aquifer (Table 47, Figure 43).[61]

The IGPA also establishes a two-phase wellhead protection program for enhanced groundwater protection. Phase I establishes a 1,000 setback zone around community and non-community water supply wells. Phase II delineates a 5-year recharge area for the CWS well extending beyond 1000 feet of an existing wellhead protection area. Wellhead protection areas are not regulated and are used for educational purposes.[62] In the Lower Salt Creek planning area, neither Phase I or Phase II setback zones have been established (Figure 43).

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[60] Illinois General Assembly, Illinois Groundwater Protection Act (IGPA; P.A. 85-0863), http://www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=1595&ChapterID=36, (accessed December 1, 2014).

[61] IEPA. "IGPA Maximum Setback Zones Community Water Supply Groundwater Quality Protection," http://www.epa.state.il.us/water/groundwater/maximum-setback-zones/ (accessed December 1, 2014).

[62] IEPA. "The Illinois Wellhead Protection Program Pursuant to Section 1428 of the Federal Safe Drinking Water Act SDWA," State of Illinois

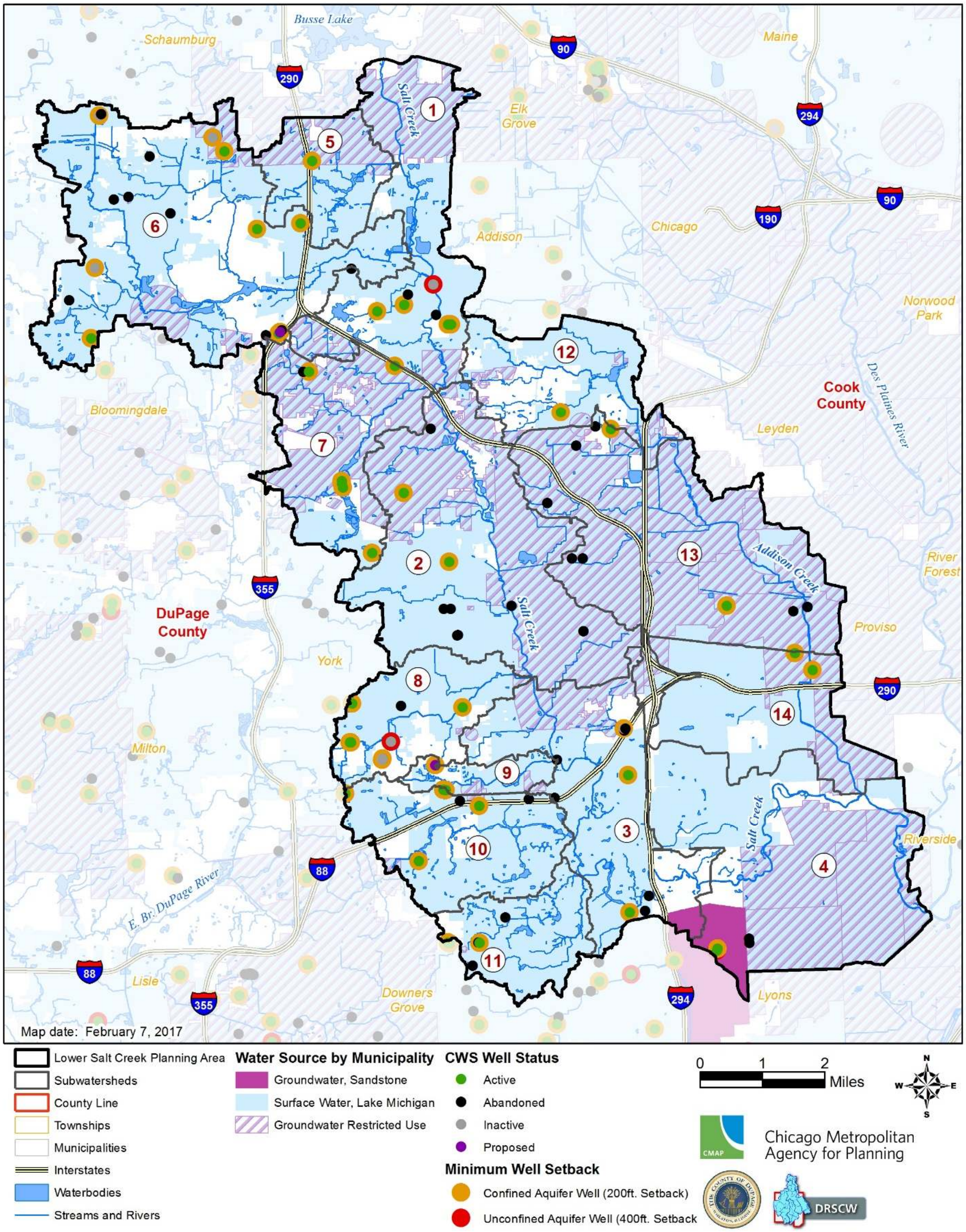
Table 47. Number of community water supply wells in the Lower Salt Creek planning area.

Municipality	*# CWS Wells*	*# of aquifer wells with no setback*	*# of confined aquifer wells (200 ft. setback)*	*# of unconfined aquifer wells (400 ft. setback)*
Addison	8	2	6	--
Bellwood	5	2	3	--
Bensenville	1	--	1	--
Bloomingdale	2	1	1	--
Elk Grove Village	3	--	3	--
Elmhurst	6	6	--	--
Hinsdale	3	2	1	--
Itasca	4	2	2	--
La Grange	2	2	--	--
Lombard	4	1	3	--
Oak Brook	7	4	3	--
Oakbrook Terrace	2	--	2	--
Roselle	5	4	1	--
Schaumburg	2	1	1	--
Villa Park	6	4	2	--
Western Springs	2	--	1	1
Westmont	4	3	1	--
Wood Dale	7	2	4	1
Unincorporated	16	6	9	1
Totals	**89**	**42**	**44**	**3**

However, under 35 Ill. Adm. Code 742, municipalities have enacted groundwater ordinances to restrict the use of establishing new potable water supply wells that go through IEPA's review process. Groundwater restricted use boundaries also specify where new CWS wells are prohibited by local ordinance(s) because of the possible presence of groundwater contamination. However, it is possible that private potable water supply wells established prior to the ordinance adoption may still be operating in these areas.[63]

[63] Illinois General Assembly, Part 742 - Tiered Approach to Corrective Action Objectives, ftp://www.ilga.gov/JCAR/AdminCode/035/035007420B02000R.html (accessed October 27, 2016).

Figure 43. Community water supply wells and groundwater restricted use areas in the Lower Salt Creek planning area.



3.7 Pollutant Sources

3.7.1 Nonpoint Sources

Addressing designated-use impairments within the planning area is one of the primary reasons for developing this watershed plan. Another reason is to protect good water quality and designated-use attainment where present in the planning area. Table 48 provides the known details of water quality assessments according to Illinois EPA and as published in their 2016 Integrated Report. …

Section to be completed…or combined with previous section…

Table 48. Known and potential causes and sources of water pollution in the Lower Salt Creek planning area.

Streams	
Causes of Impairment	**Sources of Impairment**
Lakes	
Causes of Impairment	**Sources of Impairment**
Salt Creek	
Causes of Impairment	**Sources of Impairment**
Groundwater	
Causes of Impairment	**Sources of Impairment**

3.7.1.1 Nonpoint Source Pollutant Load Modeling[64]

A critical step in providing recommendations within this plan is the identification of the different pollutant sources within the watershed and the relative magnitude of pollutant loads from those sources.

For nonpoint source pollution, an effective method to estimate pollutant loads at the watershed scale is to use variable watershed characteristics that can affect pollutant load contributions, such as land use, soils, etc. The U.S. Environmental Protection Agency's planning level tool, Spreadsheet Tool to Estimate Pollutant Loads (STEPL), was used to develop "existing conditions" nonpoint source pollutant load estimates for total nitrogen, total phosphorus, biological oxygen demand (BOD), and sediment within the Lower Salt Creek planning area.

One of the primary inputs to STEPL is land use information. The land use data used in the Lower Salt Creek watershed analysis was based on CMAP's 2013 land use data. STEPL allows for a detailed breakdown of the broader urban land use category into categories such as commercial, single-family residential, etc. to develop more refined pollutant load estimates based on variable pollutant concentrations in stormwater runoff from these land uses.

In an effort to further refine the pollutant load estimates for the watershed, the pollutant load estimates were developed at the subwatershed "study unit" level using delineated subwatershed boundaries, which separates the planning area into 14 subwatershed study units. Estimating the pollutant loads at the subwatershed level provides the opportunity to evaluate study units on a relative pollutant load contribution basis and to better target the recommendations included in this plan and in future planning efforts. The "existing conditions" nonpoint source pollutant load estimates, by subwatershed study unit, for nitrogen, phosphorus, biological oxygen demand (BOD), and sediment are shown in Table 49 and Figure 44 through Figure 47. Visual representations of the pollutant load estimates on a study unit basis are also illustrated in the accompanying figures. The pollutant load estimates are also presented by pollutant type and land use in Table 50 through Table 53 at the end of this section.

There are a few things to keep in mind regarding the use and capabilities of STEPL:

- STEPL was not used to analyze pollutant loads from streambank erosion at the watershed scale.
- STEPL does not account for drain tile contributions of pollutants.
- Pollutants from construction sites were not included in the analysis. Pollutant loads from construction sites can be highly variable and should be analyzed on a site-by-site basis and should be addressed through Illinois EPA's NPDES program for construction activities.

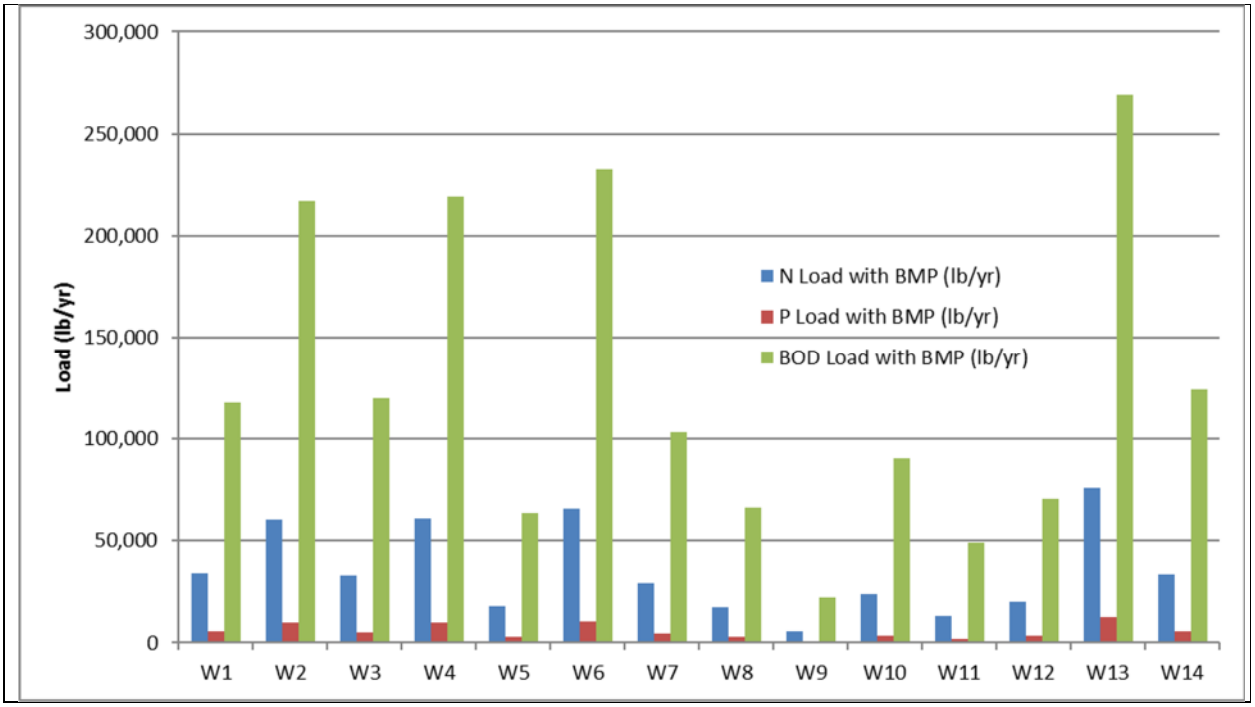
[64] STEPL modeling was conducted By DuPage County Stormwater Management and results provided via email correspondence to the author(s), Xxxxx, 2017.

- It is important to recognize that STEPL is not an in-stream response model and only estimates watershed pollutant loading based on coarse data, such as event mean concentrations.
- STEPL is not calibrated. Additional monitoring data and a more sophisticated watershed loading model would be required to develop a calibrated model for the Lower Salt Creek watershed.

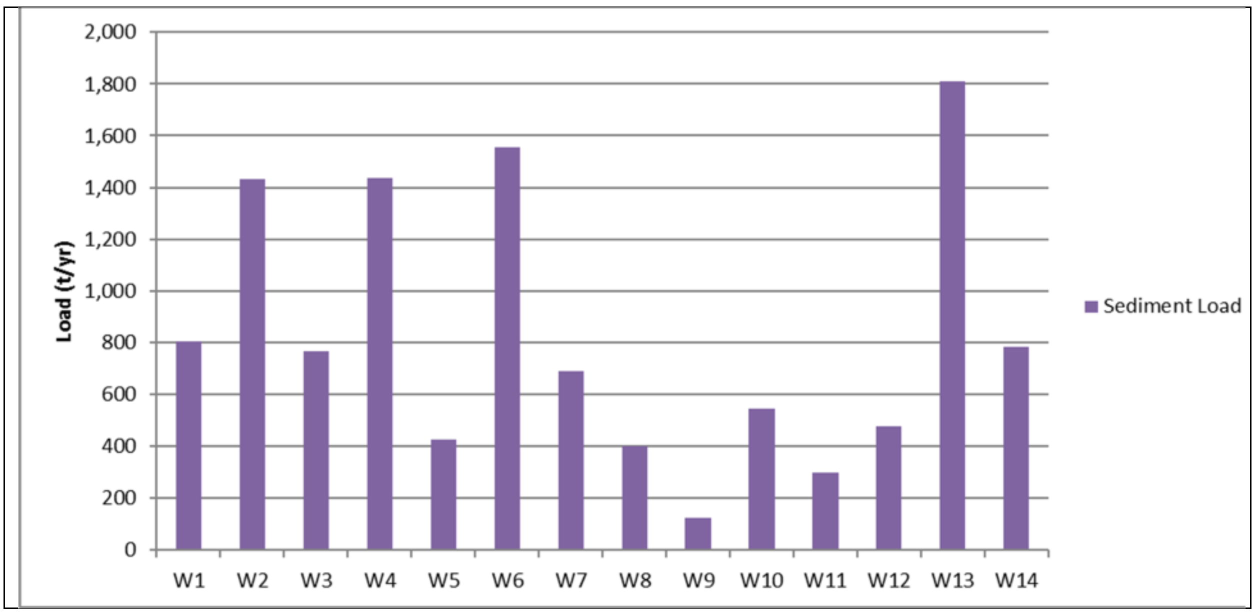
Nonetheless, STEPL serves as a useful planning-level tool for estimating relative contributions of different pollutant sources within the Lower Salt Creek watershed planning area.

Table 49. Land use-based nonpoint source (NPS) pollutant load estimates.

Subwatershed		Nitrogen Load		Phosphorus Load		BOD Load		Sediment Load	
#	Name	lb/yr	lb/ac/yr	lb/yr	lb/ac/yr	lb/yr	lb/ac/yr	t/yr	t/ac/yr
1	Salt Crk North	33,780	6.9	5,362	1.1	117,784	24.0	805	0.16
2	Salt Crk Central	60,129	7.6	9,882	1.2	216,803	27.4	1,432	0.18
3	Salt Crk South	33,127	6.6	5,034	1.0	120,141	23.8	765	0.15
4	Salt Crk Southeast	60,988	7.6	9,808	1.2	218,961	27.4	1,438	0.18
5	Devon Ave. Trib.	17,938	8.9	2,849	1.4	63,710	31.5	425	0.21
6	Spring Brook Crk	65,470	6.9	10,501	1.1	232,521	24.6	1,555	0.16
7	Westwood Crk	28,960	7.6	4,634	1.2	103,285	27.2	687	0.18
8	Sugar Crk	17,347	6.7	2,813	1.1	65,977	25.3	399	0.15
9	Oak Brook Trib.	5,641	7.4	772	1.0	22,225	29.2	123	0.16
10	Ginger Crk	23,738	6.9	3,664	1.1	90,174	26.3	544	0.16
11	Bronswood Trib.	13,108	6.3	2,006	1.0	49,234	23.6	300	0.14
12	Addison Crk North	20,132	6.6	3,225	1.1	70,731	23.3	479	0.16
13	Addison Crk Cntral	75,854	9.9	12,434	1.6	268,947	35.0	1,808	0.24
14	Addison Crk South	33,703	9.2	5,523	1.5	124,058	33.7	782	0.21
	Totals	**489,915**	**105.1**	**78,507**	**16.6**	**1,764,551**	**382.3**	**11,542**	**2.44**



300,000
250,000
200,000
150,000
100,000
50,000
0
Load (lb/yr)
N Load with BMP (lb/yr)
P Load with BMP (lb/yr)
BOD Load with BMP (lb/yr)
W1
W2
W3
W4
W5
W6
W7
W8
W9
W10
W11
W12
W13
W14



2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
Load (t/yr)
Sediment Load
W1
W2
W3
W4
W5
W6
W7
W8
W9
W10
W11
W12
W13
W14

Figure 44. Average annual total nitrogen (TN) loading rate by subwatershed.

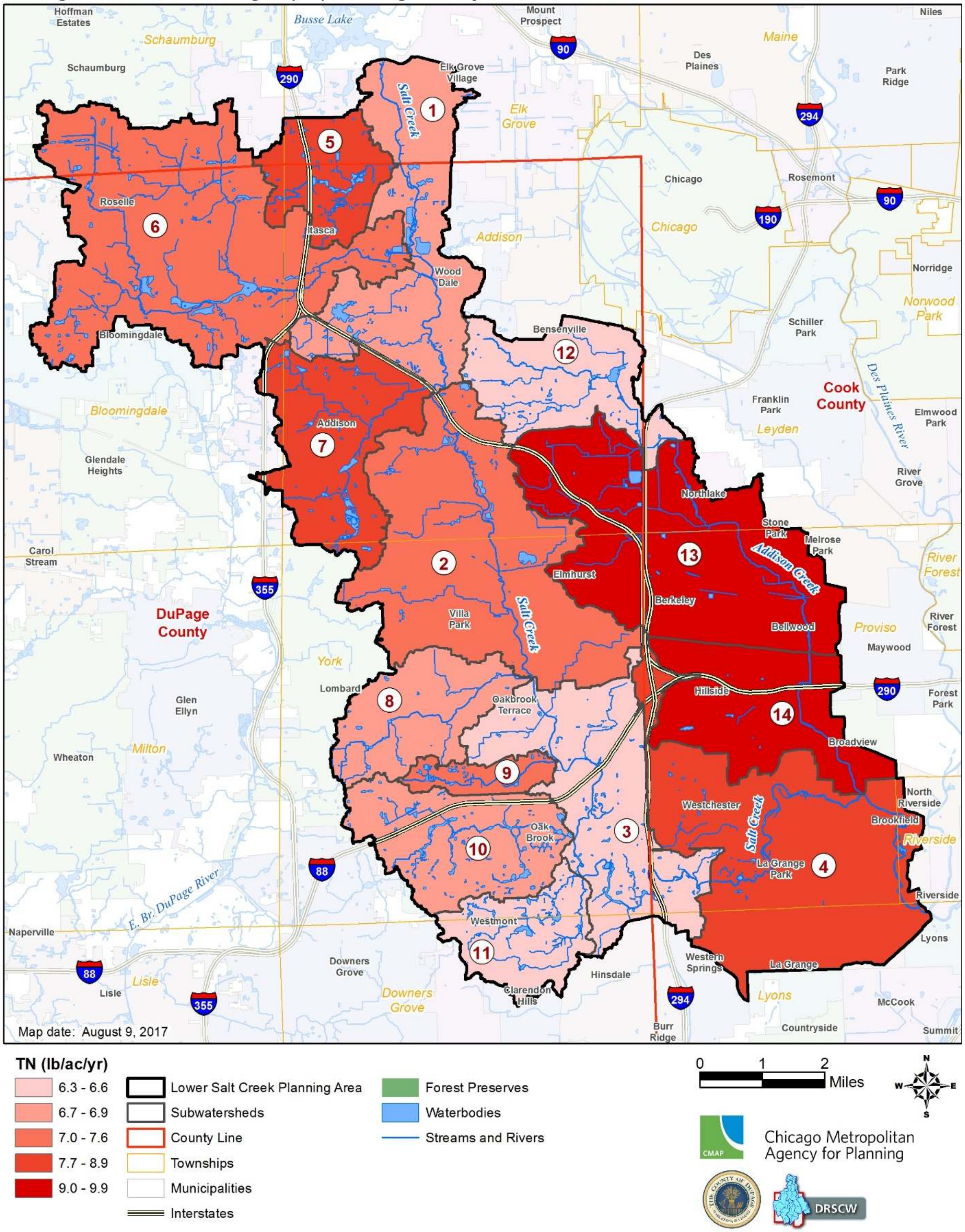


Figure 45. Average annual total phosphorus (TP) loading rate by subwatershed.

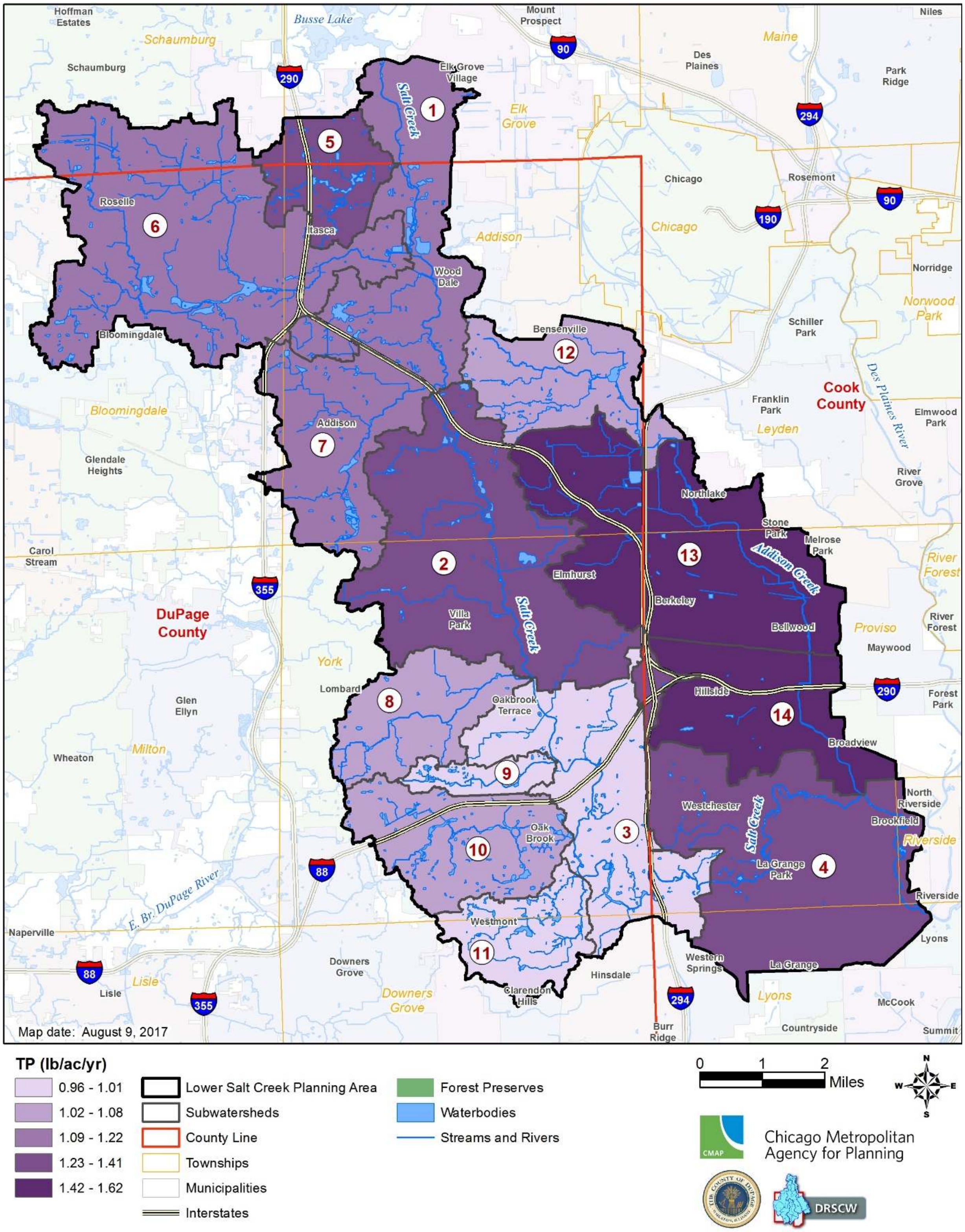


Figure 46. Average annual biological oxygen demand (BOD) loading rate by subwatershed.

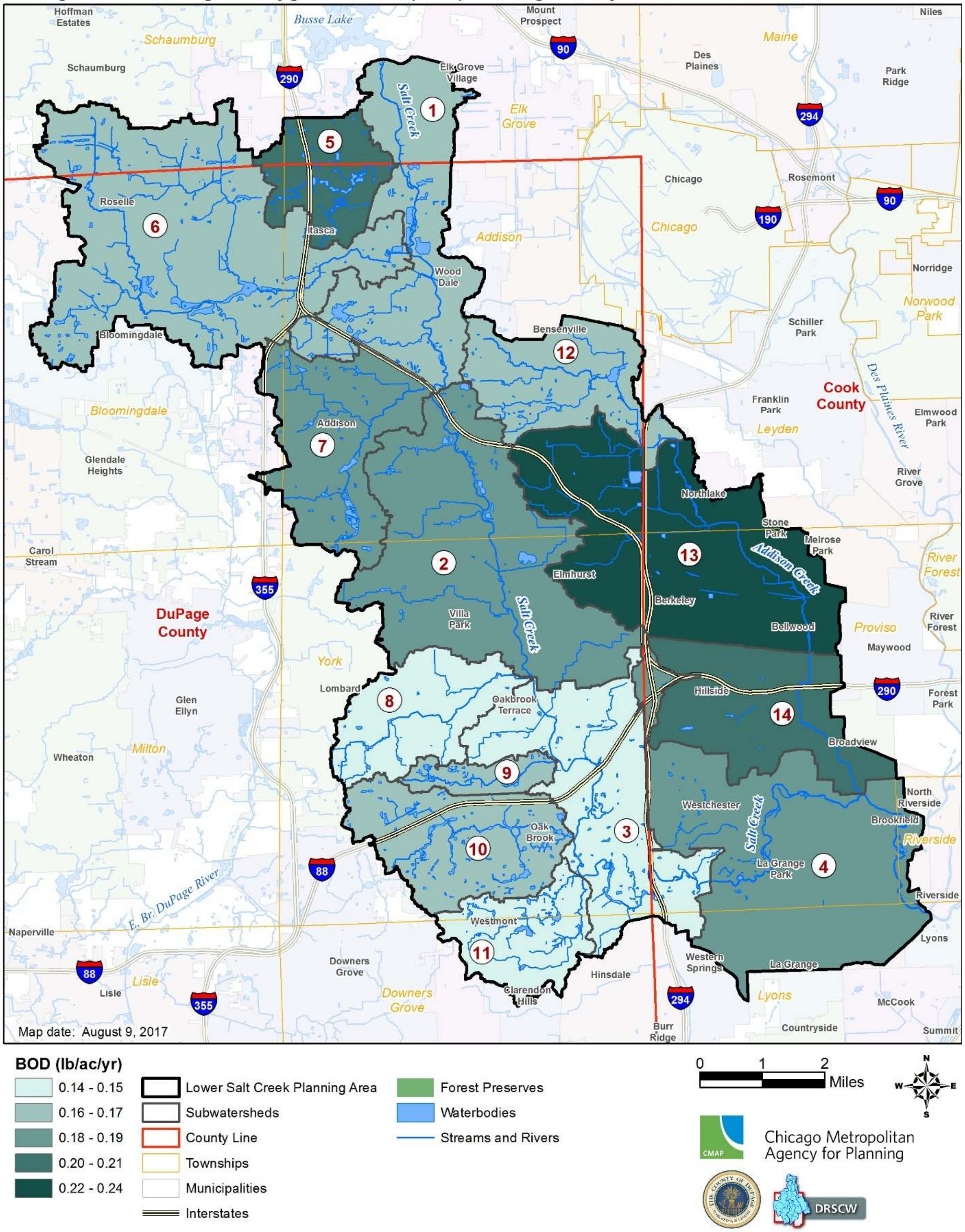


Figure 47. Average annual sediment loading rate by subwatershed.

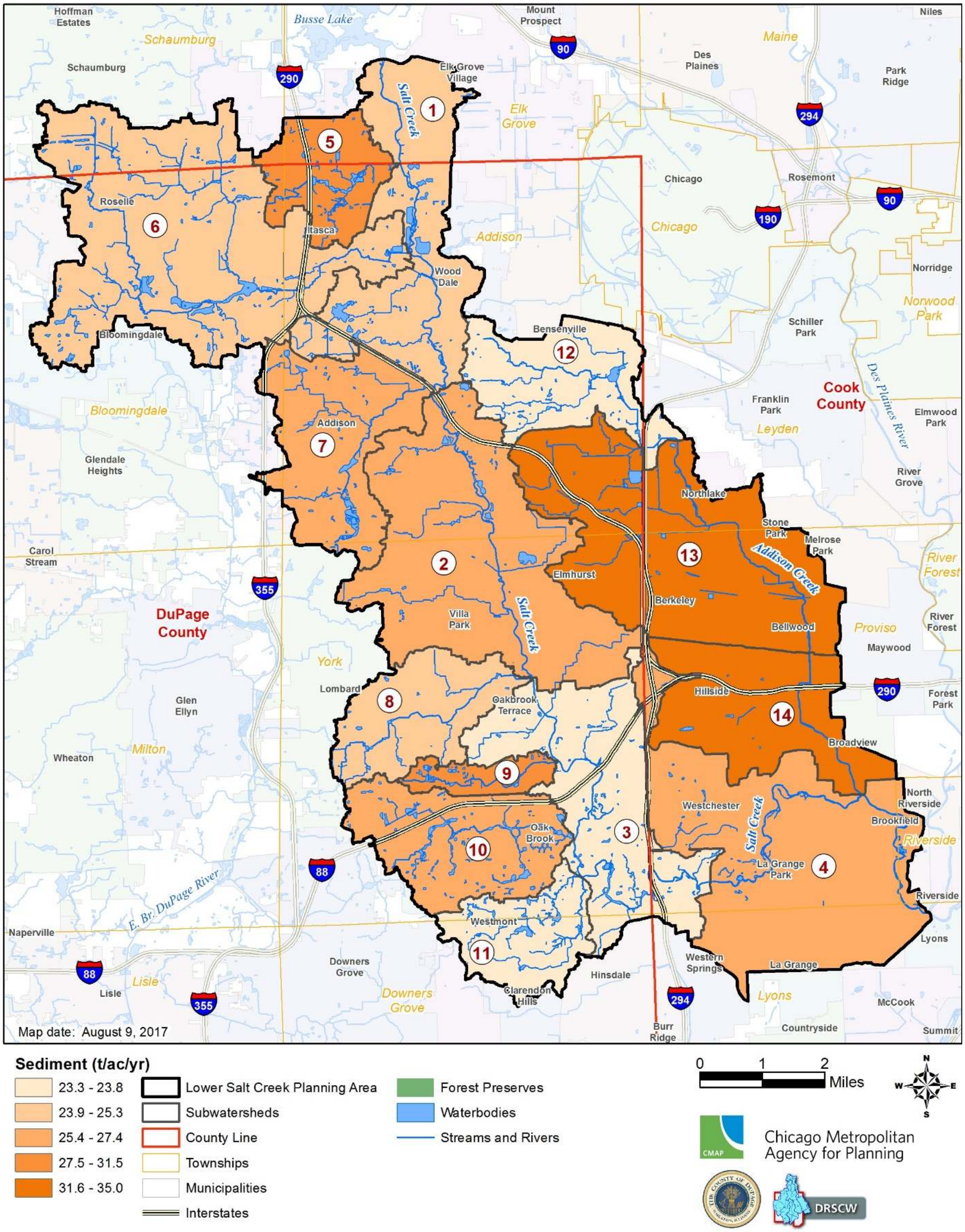


Table 50. Land use-based NPS nitrogen load estimates (pounds/year).

	Subwatershed	Commercial	Industrial	Institutional	Transpor-tation	Multi-Family	Single-Family	Open Space	Cropland
1	Salt Crk North								
2	Salt Crk Central								
3	Salt Crk South								
4	Salt Crk Southeast								
5	Devon Ave. Trib.								
6	Spring Brook Crk								
7	Westwood Crk								
8	Sugar Crk								
9	Oak Brook Trib.								
10	Ginger Crk								
11	Bronswood Trib.								
12	Addison Crk North								
13	Addison Crk Cntral								
14	Addison Crk South								
	Totals								

Table 51. Land use-based NPS phosphorus load estimates (pounds/year).

	Subwatershed	Commercial	Industrial	Institutional	Transpor-tation	Multi-Family	Single-Family	Open Space	Cropland
1	Salt Crk North								
2	Salt Crk Central								
3	Salt Crk South								
4	Salt Crk Southeast								
5	Devon Ave. Trib.								
6	Spring Brook Crk								
7	Westwood Crk								
8	Sugar Crk								
9	Oak Brook Trib.								
10	Ginger Crk								
11	Bronswood Trib.								
12	Addison Crk North								
13	Addison Crk Cntral								

14	Addison Crk South								
	Totals								

Table 52. Land use-based NPS BOD load estimates (pounds/year).

	Subwatershed	Commercial	Industrial	Institutional	Transpor-tation	Multi-Family	Single-Family	Open Space	Cropland
1	Salt Crk North								
2	Salt Crk Central								
3	Salt Crk South								
4	Salt Crk Southeast								
5	Devon Ave. Trib.								
6	Spring Brook Crk								
7	Westwood Crk								
8	Sugar Crk								
9	Oak Brook Trib.								
10	Ginger Crk								
11	Bronswood Trib.								
12	Addison Crk North								
13	Addison Crk Cntral								
14	Addison Crk South								
	Totals								

Table 53. Land use-based NPS sediment load estimates (tons/year).

	Subwatershed	Commercial	Industrial	Institutional	Transpor-tation	Multi-Family	Single-Family	Open Space	Cropland
1	Salt Crk North								
2	Salt Crk Central								
3	Salt Crk South								
4	Salt Crk Southeast								
5	Devon Ave. Trib.								
6	Spring Brook Crk								
7	Westwood Crk								
8	Sugar Crk								
9	Oak Brook Trib.								

10	Ginger Crk	
11	Bronswood Trib.	
12	Addison Crk North	
13	Addison Crk Cntral	
14	Addison Crk South	
	Totals	

3.7.1.2 Streambank Erosion Pollutant Load Estimates

Pollutant loads from eroding streambanks were estimated using U.S. EPA's Spreadsheet Tool to Estimate Pollutant Loads (STEPL). … Results of the spreadsheet tool analyses are provided in Table 54.

This section will be completed pending stream bank erosion modeling by DCSM from data provided by DRSCW …

Table 54. Streambank erosion pollutant load estimates.

Subwatershed		*Length Assessed (ft)*	*Nitrogen Load (lb/yr)*	*Phosphorus Load (lb/yr)*	*Sediment Load (T/yr)*
#	*Name*				
1	Salt Creek North				
2	Salt Creek Central				
3	Salt Creek South				
4	Salt Creek Southeast				
5	Devon Ave Tributary				
6	Springbrook Creek				
7	Westwood Creek				
8	Sugar Creek				
9	Oak Brook Tributary				
10	Ginger Creek				
11	Bronswood Tributary				
12	Addison Creek North				
13	Addison Creek Central				
14	Addison Creek South				
	Totals				

3.7.2 Point Sources

3.7.2.1 National Pollutant Discharge Elimination System (NPDES)

Authorized under amendments made to the Clean Water Act in 1987, the U.S. Environmental Protection Agency (U.S. EPA) uses permits issued through the National Pollutant Discharge Elimination System (NPDES) to manage pollution to waterbodies from a variety of point sources. Illinois EPA issues the permits through delegation of authority by U.S. EPA. Point sources regulated through NPDES include wastewater treatment plants, industrial dischargers, concentrated animal feeding operations (CAFOs), combined sewer overflows (CSOs), sanitary sewer overflows (SSOs), and urban stormwater runoff discharged via a pipe.[65] The NPDES program plays a key role in protecting and restoring water quality. Issued permits set discharge limits specific to the waterbody (within in which the pollution is being discharged), require monitoring and reporting of pollutants and water quality indicators such as dissolved oxygen (DO) and biological oxygen demand (BOD), and limit the discharge of specific pollutants including total suspended solids, ammonia nitrogen, fecal coliform, and phosphorus.

NPDES Wastewater Discharge Permittees and Facility Planning Areas

There are 28 permitted dischargers of wastewater in the planning area (Figure 48Figure 48. NPDES wastewater discharge permits in the Lower Salt Creek planning area.). Of these, 16 are municipal permit holders and 12 are private facility permittees. Collectively, they hold 145 discharge permits within the Lower Salt Creek planning area.

Facility planning areas are also shown in Figure 48. A facility planning area (FPA) is the geography served by a wastewater treatment plant based on plant capacity, development plans, and other nearby FPAs. The FPA includes both the current sewer-service area as well as unsewered areas that are expected to be developed and served in the future. The DuPage County portion of the planning area is served by 11 FPAs, while the Cook County portion is entirely served by the Metropolitan Water Reclamation District of Greater Chicago (MWRD).

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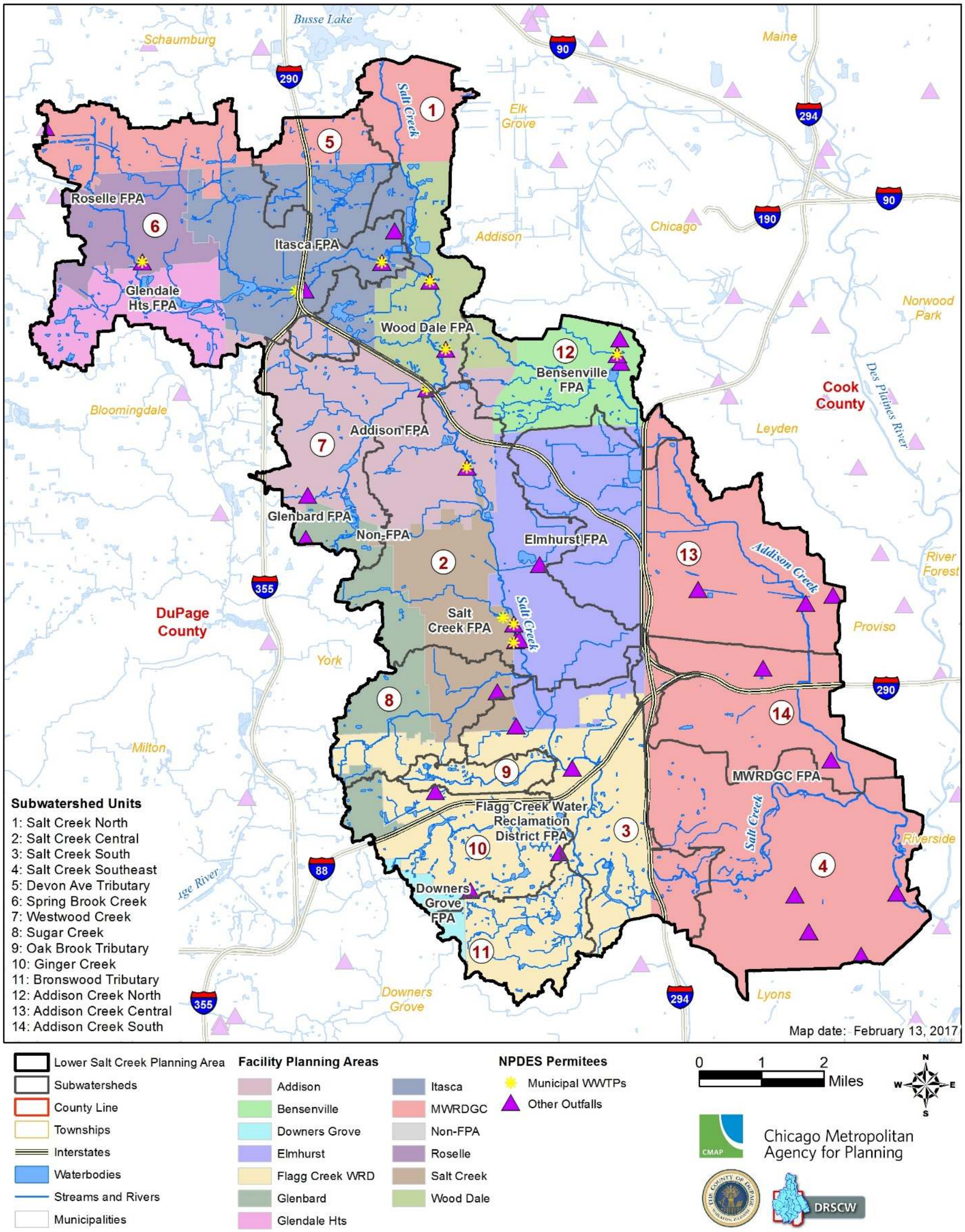
[65] "NPDES Permit Program Basics," U.S. EPA, last modified January 4, 2011, accessed October 12, 2011, http://cfpub.epa.gov/npdes/home.cfm? program_id=45.

Figure 48. NPDES wastewater discharge permits in the Lower Salt Creek planning area.



NPDES Stormwater Program

The stormwater component of the NPDES Program was implemented in two phases. Phase I of this program was implemented in 1990 and applies to medium and large municipal separate storm sewer systems (MS4s) as well as certain counties with populations of 100,000 or more. Phase I MS4 permittees are regulated under individual permits and are informed by the regulations at 40 C.F.R. 122.26(d).[66] Phase II was implemented in 2003 and expanded the scope of storm sewer systems which are subject to NPDES.[67] Phase II applies to small MS4s[68] including smaller construction or industrial sites that are owned and operated in urbanized areas.[69] Industrial sites or construction activities that disturb one or more acres of land must obtain an NPDES permit before construction activities begin.[70] Most Phase II MS4 permittees are regulated under a general permit.

Under the terms of Phase II permits, industrial, construction, and MS4 Phase II permittees are required to implement certain practices that control pollution in stormwater runoff. To prevent the contamination of stormwater runoff, industrial and construction permittees must develop a stormwater pollution prevention plan, while MS4 permittees must develop a similar stormwater management program. Stormwater runoff carrying pollutants from impervious surfaces can degrade water quality when discharged untreated into local rivers and streams, as is often the case. Programs like Phase II that encourage planning and implementation on a watershed basis are therefore vital for protecting water quality from stormwater runoff from both large and small separate stormwater sewer systems as well as industrial and construction sites.

In Illinois, discharges from small MS4s are regulated under Illinois EPA's General NPDES Permit No. ILR40. The central feature of this permit is a requirement that MS4 operators develop, implement, and enforce a stormwater management program to reduce the discharge of pollutants. A Phase II permittee's stormwater management program must include six minimum control measures as outlined in 40 C.F.R. 122.34(b)[71]:

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[66] U.S. EPA. *MS4 Permit Improvement Guide*. EPA 833-R-10-001. Washington, DC: U.S. EPA, 2010. https://www3.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf (accessed February 14, 2017).

[67] "NPDES Stormwater Program," U.S. EPA, last modified January 4, 2011, accessed October 13, 2011, http://cfpub.epa.gov/npdes/home.cfm? program_id=6.

[68] Illinois EPA, Bureau of Water, MS4s Permittees, http://www.epa.state.il.us/water/permits/storm-water/ms4-status-report.pdf (accessed November 13, 2014)

[69] "NPDES Stormwater Program," U.S. EPA, last modified January 4, 2011, accessed October 13, 2011, http://cfpub.epa.gov/npdes/home.cfm? program_id=6.

[70] U.S. EPA. "Stormwater Phase II Final Rule: An Overview." EPA Report No. 833-F-00-001. Washington, D.C.: U.S. EPA, 2005. http://www.epa.gov/npdes/ pubs/fact2-0.pdf (accessed October 12, 2011).

[71] U.S. EPA. *MS4 Permit Improvement Guide*. EPA 833-R-10-001. Washington, DC: U.S. EPA, 2010. https://www3.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf (accessed February 14, 2017).

1. Public education and outreach on storm water impacts
2. Public involvement and participation
3. Illicit discharge detection and elimination
4. Construction site storm water runoff control
5. Post construction storm water management in new development and redevelopment
6. Pollution prevention / good housekeeping for municipal operations

To define its storm water management program, a permittee must define best management practices (BMPs) and measureable goals for each of the six minimum control measures.

In order to obtain coverage under the permit, permittees must submit to Illinois EPA a completed Notice of Intent (NOI)[72] describing its BMPs and measurable goals, providing other program specifics, and identifying any arrangements made with others to share program responsibilities. Once coverage has been granted, a permittee must submit an annual report to Illinois EPA by June 1 which must include the following:

1. The status of compliance with the permit conditions, including an assessment of the BMPs and progress toward the measurable goals;
2. Results of any information collected and analyzed, including monitoring data;
3. A summary of the stormwater activities planned for the next reporting cycle;
4. A change in any identified best management practices or measurable goals; and
5. If applicable, notice of relying on another governmental entity to satisfy some of the permit obligations.[73]

Stormwater Management Ordinances

In addition to the MS4 program, both DuPage and Cook County has as county-wide ordinances to manage the impacts of urbanization on stormwater drainage, safeguard public health and safety, protect the environment, and support response land use decisions.[74, 75] Each ordinance

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[72]Illinois EPA, Bureau of Water. Notice of Intent for New or Renewal of General Permit for Discharges from Small Municipal Separate Storm Sewer Systems – MS4's. http://www.epa.state.il.us/water/permits/storm-water/forms/notice-intent-ms4.pdf

[73] M. Novotney. Lake Co. Stormwater Management Commission. 2013. *Personal communication*. There are several other noteworthy requirements of the program, including: (1) annual program review as part of annual report preparation; and, (2) at least annual monitoring of receiving waters, use of indicators to gauge the effects of stormwater discharges on the physical/habitat-related aspects of receiving waters, and/or monitoring BMP effectiveness.

[74] Metropolitan Water Reclamation District of Great Chicago. https://www.mwrd.org/pv_obj_cache/pv_obj_id_B8C7A4FC0080A6A35076861145E0C0A534186200/filename/WMO.pdf (accessed February 17, 2017).

[75] DuPage Countywide Stormwater and Floodplain Ordinance. https://www.dupageco.org/EDP/Stormwater_Management/Docs/40943/ (accessed February 17, 2017).

articulates a set of regulations, procedures, and/or programmatic structures to promote and help implement these objectives.

DuPage County has the DuPage Countywide Stormwater and Floodplain Ordinance (DCCSFPO). [76] The ordinance is enforced by DuPage County Stormwater Management, however, municipalities are given the opportunity to receive authorization to review and process stormwater permits within their jurisdiction.[77] Municipalities that choose to perform these duties are called complete waiver communities; municipalities that chose to review all aspects of the permits except for development in Special Management Areas are called non-waiver and partial waiver communities (Table 55**Error! Reference source not found.**).[78,79] The DCCSFPO was last revised in April 2013, and applies to all development within DuPage County that exist after February 15, 1992.[80]

Cook County has the Watershed Management Ordinance (WMO), which is administered and enforced by the Metropolitan Reclamation District of Great Chicago (MWRDGC). The WMO applies to all development within the boundaries of Cook County, except for the City of Chicago. Similar to DuPage County, some municipalities within Cook County have been given authorization to administer and enforce certain aspects of the WMO. If the boundaries of a municipality fall within Cook County as well as an adjacent county, it is has the option to adopt and enforce the WMO or the ordinance of the adjacent county. The Village of Hinsdale and Village of Roselle – two municipalities whose boundaries intersect the Lower Salt Creek planning area – have chosen to adopt and enforce the WMO rather than the DCCSFPO (Table 55).

The provisions set forth in these ordinances are complementary to the principles of watershed planning. Although the word, 'watershed,' is not in the title of DuPage's ordinance, the DCCSFPO specifically calls out the need for assessing stormwater management and flood control at the watershed scale, and thereby, requires watershed plans to be prepared for the county's six major watersheds. Furthermore, each ordinance outlines a set of regulations that work to protect riparian and wetland, manage floodplains, reduce erosion, control sediment, and manage stormwater through runoff, volume control, and/or detention requirements which are often based on the type of development and impervious cover. The WMO is unique in that is provides design specs for

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[76] Ibid.

[77] Authorization excludes the review and processing of permits that involve a floodway.

[78] DuPage County Stormwater Management. Stormwater Regulatory Services. http://www.dupageco.org/EDP/Stormwater_Management/1165/ (accessed February 17, 2017).

[79] DuPage County Stormwater Management. Stormwater Ordinance Administrators, August 29, 2013. https://www.dupageco.org/EDP/Stormwater_Management/Docs/40943/ (accessed February 17, 2017)

[80] Ibid.

stormwater BMPs including detention basins. In some jurisdictions, HOAs may take on this upkeep, and thereby have a key role in the scheme of local stormwater management.

Table 55. MS4 Communities within the Lower Salt Creek planning area by level of authority to administer and enforce stormwater or watershed management ordinances.

Jurisdiction	*Full Authorization*	*Partial Authorization*[81]	*No Authorization*
Addison	Yes		
Bellwood			Yes
Bensenville		Yes	
Berkeley			Yes
Bloomingdale*	Yes	Yes	
Broadview			Yes
Brookfield			Yes
Clarendon Hills		Yes	
Downers Grove	Yes		
DuPage County, Unincorporated*		Yes	
Elk Grove Village*		Yes	
Elmhurst		Yes	
Franklin Park			Yes
Hillside			Yes
Hinsdale***		Yes	
Itsaca		Yes	
La Grange			Yes
La Grange Park			Yes
Lombard		Yes	
Lyons			Yes
Maywood			Yes
Melrose Park			Yes
North Riverside			Yes
Oak Brook	Yes		
Oak Brook Terrace		Yes	
Roselle***		Yes	
Schaumburg*		Yes	
Stone Park			Yes
Village Park*		Yes	
Westchester**	Yes		
Western Springs**	Yes		
Wood Dale	Yes		

[81] Partial authorization includes both partial waiver and non-waiver communities.

* Non-waiver communities within DuPage County (see footnote 69).
** Municipalities that have entered into an intergovernmental agreement with MWRD that grants authorization to administer aspects of the WMO, including the issuance of watershed management permits.
*** Municipalities that have chosen to adopt and enforce the WMO rather than the DuPage Countywide Stormwater and Floodplain Ordinance.

3.7.2.2 Leaking Underground Storage Tanks

Leaking underground storage tanks (UST) are a source of environmental contamination and threaten the quality and safety of groundwater as a source of drinking water. The Office of the State Fire Marshall regulates the daily operation and maintenance of underground storage tank systems, and the Illinois EPA becomes involved once a release (i.e., leak) has been reported to the Illinois Emergency Management Agency (IEMA). Following a tank release report to IEMA, Illinois EPA's Leaking UST section begins oversight of remedial operations.[82]

While leaking UST sites are a concern wherever they exist, they are particularly relevant in an area of groundwater-dependent communities and private-well owners. The Lower Salt Creek planning area includes 1,140 leaking UST sites (Table 56, Figure 49). A large number of sites reside in Addison, Elmhurst, and Villa Park. Based on the planning area's subwatershed units, Salt Creek Central and Addison Creek Central have the most leaking USTs.

Knowledge of leaking UST sites and their clean-up status can work in favor of developing wellhead protection plans for existing community water supply wells. These plans can also reduce the vulnerability of wells to other potential sources of contamination. For more information regarding the status of leaking UST sites, readers are referred to the Leaking UST Incident Tracking database.[83]

An Underground Storage Tank Fund was established in 1989 to help owners and operators pay for cleaning up leaks from petroleum USTs. Illinois generates money for the leaking UST Fund through a $0.003 per gallon motor fuel tax and a $0.008 per gallon environmental impact fee, both of which are set to expire January 1, 2025.

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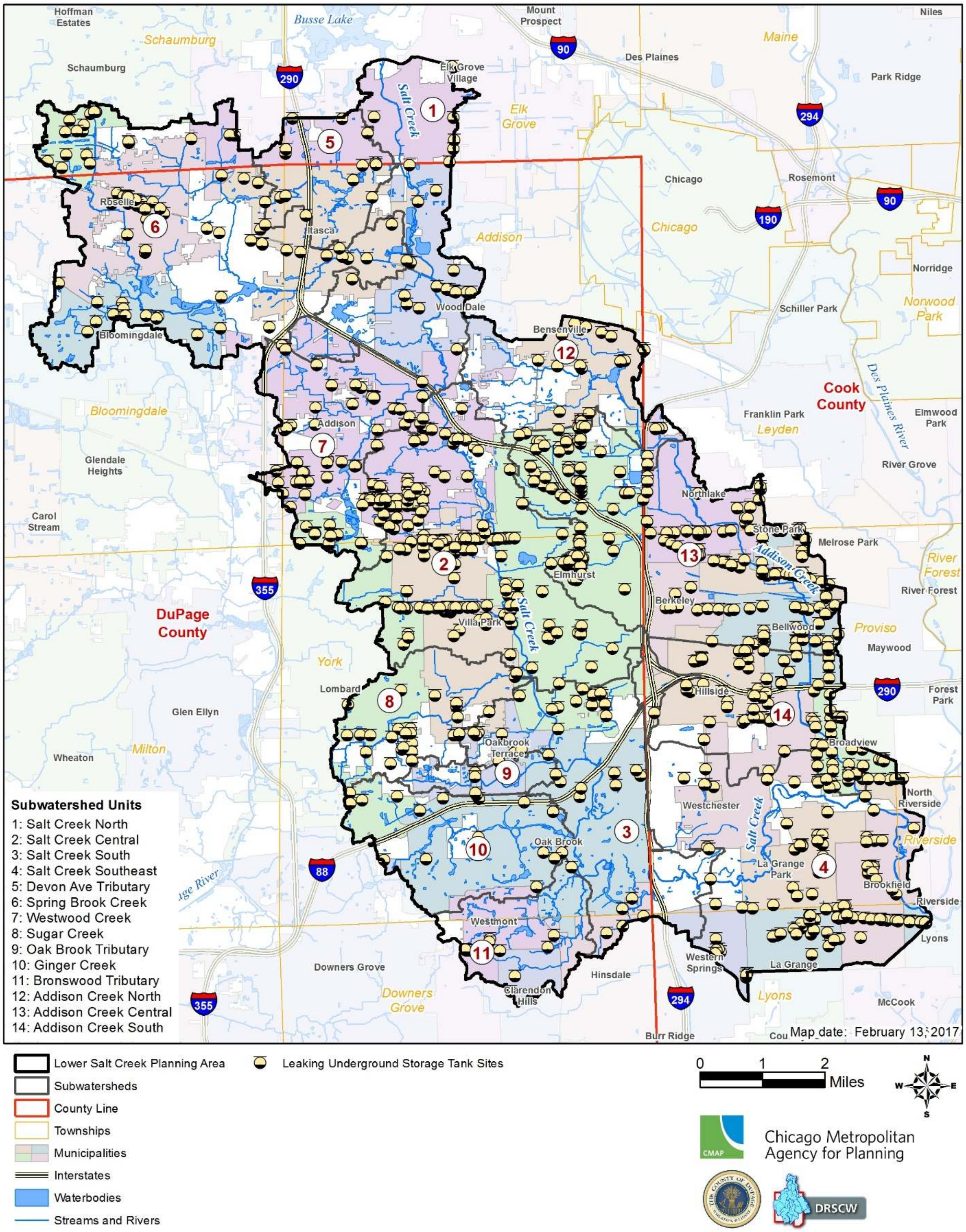
[82] Illinois EPA. http://www.epa.state.il.us/land/lust/introduction.html

[83] Illinois EPA. http://epadata.epa.state.il.us/land/ust/

Table 56. Leaking underground storage tank sites.

Subwatershed		*# Leaking*
#	*Name*	*USTs*
1	Salt Creek North	33
2	Salt Creek Central	212
3	Salt Creek South	49
4	Salt Creek Southeast	153
5	Devon Avenue Tributary	18
6	Spring Brook Creek	100
7	Westwood Creek	90
8	Sugar Creek	32
9	Oak Brook Tributary	6
10	Ginger Creek	21
11	Bronswood Tributary	13
12	Addison Creek North	41
13	Addison Creek Central	260
14	Addison Creek South	112
	Total	**1,140**

Figure 49. Leaking underground storage tank (UST) sites in the Lower Salt Creek planning area.



3.7.3 Significant Sources of Chloride[84]

In October 2004, the United States Environmental Protection Agency (USEPA) approved chloride TMDLs for Salt Creek (IEPA, 2004). The TMDLs call for reductions in chloride loading, specifically from winter road salt application in the watersheds.

The TMDLs for these watersheds were specifically derived to achieve compliance with the State water quality standard for chloride of 500 mg/L. This general use chloride water quality standard (WQS) was adopted in 1972 by the Illinois Pollution Control Board (IPCB). It lies between the acute and chronic chloride limits established by USEPA. Salt Creek is designated for general use; therefore, the 500 mg/L standard applies to the Lower Salt Creek planning area.

The Salt Creek TMDL divided the allocations into two subwatersheds, Addison Creek and Salt Creek, which were targeted for 41% and 8% reductions, respectively (IEPA, 2004, Salt Creek TMDL). The DRSCW's review of winter deicing operations and resulting loadings referenced below, groups Addison Creek into the Salt Creek watershed.

Data used by the TMDL was obtained from grab samples taken between from 1995 to 1999. During this time, there were five observed exceedances of the chloride WQS in Salt Creek, all of which were collected during the winter months. Post TMDL monitoring carried out by the DRSCW shows that winter violations of the state chloride water quality standard are frequent during winter months.

Potential sources of chloride are groundwater and discharges from publicly owned treatment works (POTWs) and MS4 communities. The average groundwater chloride concentration reported in the 2004 TMDL was 51 mg/L. It is not covered further in either the TMDL or this plan. For reference, the chloride TMDL allocations are summarized in Table 57.

Table 57. TMDL chloride allocations for point and nonpoint sources.

	Salt Creek (including Addison Creek)
Point sources, tons of Cl^-/yr	28,700
Nonpoint sources, tons of Cl^-/yr	13,300

The principle categories of dischargers identified in the planning area are 1) Publicly Owned Treatment Works, and 2) Communities with MS4 permits. Within the Lower Salt Creek planning area, chloride concentration samples were collected at Publicly Owned Treatment Works (POTWs) in the late fall of 2013, with the exceptions of Roselle Devlin WWTP and MWRDGC Egan WRP, which were sampled in late December 2015 and early January 2016

[84] This section was written by Stephen McCracken, DRSCW, and provided to CMAP via email Nov. 3, 2017.

respectively. No violations of the State water quality standard (500 mg/l) were found at any plant, but two samples from the MWRDGC Egan WRF did exceed the federal chronic standard (230 mg/l). Samples at this facility were collected during the winter months and the higher than average concentrations are likely the product of stormwater infiltration into the wastewater system. A summary of the data can be found in Table 58.

Table 58. Publicly owned treatment works in the Lower Salt Creek planning area.

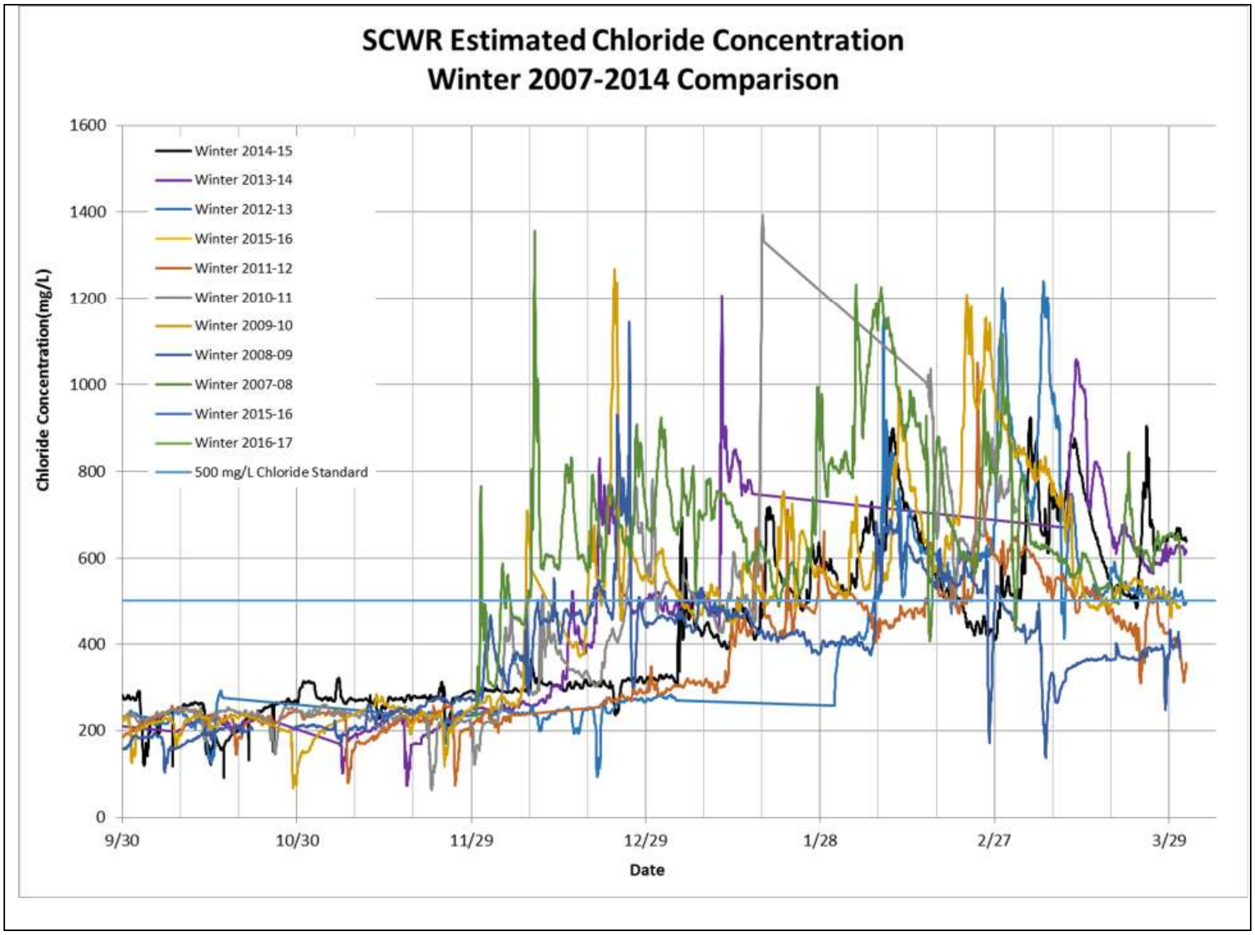
NPDES	Name	Longitude	Latitude	DAF (MGD)	DMF (MGD)	Mean Chloride mg/l (effluent)
IL0036340	MWRDGC EGAN WRP	-88.00083	42.01528	30	50	195*
IL0026280	Itasca STP	-87.9919	41.9714	3.2	8.2	124
IL0030813	Roselle-J.L. Devlin WWTP	-88.0767	41.9692	2	4	154*
IL0020061	Wood Dale North STP	-87.985	41.965	1.97	3.93	118
IL0034274	Wood Dale South STP	-87.98306	41.94917	1.13	2.33	90
IL0021849	Bensenville South STP	-87.92583	41.94778	4.7	12	NC#
IL0033812	Addison North STP	-87.98528	41.93917	5.3	7.6	156
IL0027367	Addison South-A.J. Larocca STP	-87.97389	41.92194	3.2	8	181
IL0030953	Salt Creek Sanitary District	-87.9597	41.8853	3.3	8	96
IL0028746	Elmhurst WWTP	-87.9589	41.8819	8	20	124

For communities with MS4 permits, the TMDL loading from road salting was calculated based on 14 snowfall events, the length of road surface in the watershed, and an assumed standard salt application rate of 800 pounds per lane-mile, per storm – a value based on literature from other major cities.

The conclusion of the TMDL reports was that "[the] primary contributor to the [chloride WQS] exceedances is application of road salt for snow and ice control purposes. However, due to the sporadic nature of deicing activities, on a yearly basis, the chloride mass contributed to Salt Creek watershed is larger from point sources than nonpoint sources" (IEPA, 2004, Salt Creek TMDL).

Road salt is almost entirely sodium chloride, which is composed of 39.3% sodium and 60.7% chloride, by mass. Data collected between 2006 and 2017 on winter salt concentrations confirms that winter snow and ice control is the source of water quality violations in Salt Creek (Figure 50).

Figure 50. Chloride concentrations in Salt Creek at Wolf Road, 2007-2017.



Data is derived from conductivity data gathered at the site by MWRDGC and converted to chloride concentrations by DRSCW.

In 2007, the DRSCW sent a questionnaire to over 80 deicing agencies in the Upper DuPage River and Salt Creek basins and received responses from 39 agencies (including more than 20 in the Lower Salt Creek planning area). Approximately 130 private snow removal companies in the watershed area were also sent the questionnaire.

The total amount of chloride applied in the form of road salt throughout watershed annually was estimated from the questionnaire responses. The estimated load includes salt from municipalities, townships, the Illinois State Toll Highway Authority, and county transportation departments; private snow removal companies and the Illinois Department of Transportation were not accounted for. The TMDL baseline chloride loadings (TMDL Baseline) and road salt allocations are shown for reference in Table 59.

Table 59. Estimated current chloride loading from road salt in the study area, compared with TMDL road salt chloride allocations.

	Salt Creek
DRSCW Baseline, tons of Cl^{-}/yr	32,600
TMDL Baseline, Tons of Cl^{-}/yr	15,500
TMDL Target, tons of Cl^{-}/yr	13,300

As Table 59 shows, the DRSCW questionnaire findings suggest that the TMDL under estimated application rates. Based on the DRSCW loading figure, a 51% reduction in winter de-icing materials would be necessary to meet the TMDL baseline.

4. Watershed Protection Measures

4.1 Planning, Policy, and Programming

4.1.1 General Planning and Ordinance Recommendations

4.2 BMP Implementation Projects

4.2.1 Urban Stormwater Infrastructure Retrofits

Will include watershed-wide BMPs…modeling being conducted by DCSM…

4.2.2 Stream and Riparian Buffer Restoration

4.2.3 Chloride Reduction Strategies[85]

4.2.3.1 Road Salt Storage and Applications

As detailed in section 3.7.3, road salt is the primary source of chloride water quality violations in our rivers and streams. When road salt is used as part of winter maintenance strategies; all salt applied to roadways, parking lots and sidewalks is effectively added to the water column. Thus, it is incumbent that those who use road salt use it as efficiently as possible, applying the right amount at the right time as required for any given winter storm[86] situation. Efficiencies

[85] This section written by Stephen McCracken, DRSCW, and provide to CMAP via email Nov. 3, 2017.

[86] For the purposes of this document, a winter storm situation would include frost events as well as snow fall, freezing rain, and sleet.

apply to both salt storage, to minimize any loss of road salt, and in applications, to apply the correct amount of salt and to ensure that the salt stays on the pavement surface until it has served its purpose.

Review of Existing Best Management Practices (BMPs)
There are several documents that examine BMPs for road salt storage and usage. One of the more recent is the report by the AASHTO Clear Roads pooled fund consortium entitled *"Manual of Best Management Practices for Road Salt in Winter Maintenance"* which is available at http://clearroads.org/project/roadway-salt-best-management-practices/ (accessed April 6, 2017). This manual considers BMPs for road salt procurement, storage and applications and is the primary reference manual used by the DRSCW in its chloride reduction efforts.

Some of these best practices are mandated by the State MS4 permit, where this is the case it is noted. For simplicity, the best practices for these storage and applications are considered separately.

Salt Storage Best Practices
The purpose of these best practices is to minimize any loss of road salt due to precipitation onto the stockpile, or water running into the storage area, and also to protect the ground upon which the salt is stored.

The following best storage practices are recommended for adoption by all agencies with winter snow fighting responsibilities in the plan area who store salt. MS4 permit holders must store deicing agents in a permanent storage structure and tarp any materials temporarily stored outside that structure. The permit requires Permittees who do not have a permanent storage structure but store deicing materials must construct permanent storage structure by March 1 2018.

1. Road salt must be stored on an impermeable pad at all times. Temporary storage on permeable surfaces is not acceptable. All pads must be under cover to eliminate exposure to precipitation.
2. Pads must be constructed so that rain water or other precipitation does not drain onto the pad. Any rain that drains onto the pad must be drained to a collection point, preferably a specially designed sump area.
3. Salt that is temporally not stored under a permanent structure must be covered by tarping, for example, except when the stockpile is in active use. Such piles should not be placed near storm drains or in areas that are likely to flood.
4. If the agency regularly stores smaller salt piles (5,000 tons or less) outside of a permanent structure the agency with such stockpiles should develop a plan to construct covered storage capable of containing an average year's use of salt.
5. All salt storage facilities must have policies in place for "good housekeeping" when salt is being placed into storage, and moved from storage into trucks (either for winter maintenance purposes or for movement to other storage facilities). These policies must reflect the particular conditions on site, but should be aimed at ensuring that as little salt as possible is spilled during these trans-shipment processes, and that any salt which is

spilled should be swept up and returned to storage in a timely manner to minimize any loss of salt.

6. All employees involved in salt storage must undergo training annually on best practices for road salt storage.
7. Additional information on salt storage is available in the Salt Institute "Safe and Sustainable Salt Storage Handbook" which may be accessed at: http://www.saltinstitute.org/wp-content/uploads/2013/09/Salt-Storage-Handbook-2015.pdf (accessed on 5/10/17).
8. Local units of government are recommended to adopt a storage ordinance covering private salt piles. Examples of such ordinances can be found at http://drscw.org/wp/model-ordinances/

Road Salt Applications Best Practices

The purpose of these best practices is to ensure that only as much salt as needed is placed upon the road during winter maintenance operations. The purpose of road salt in such operations is not to melt snow or ice, but rather to prevent the bond of snow or ice to the pavement. If snow or ice has already bonded to the pavement the purpose of the salt is to break the bond.
As a strategy, the best practice in winter maintenance is to anti-ice, that is to place road salt (in either liquid or solid form, but more often as a liquid brine) on the road surface prior to the start of a winter event, thus providing a protective layer that prevents snow and ice from bonding to the road surface. However, experience has shown that it takes several years for an agency to transition from more traditional winter maintenance operational strategies to anti-icing, so a series of actions leading toward anti-icing are presented here as best practices.

The following best practices will be required or recommended for dischargers who run snow fighting operations – these best practices are not pertinent to those dischargers that are simply and solely salt storage facilities. They are, however, somewhat applicable to all classes of dischargers, to the extent that all of these classes clear snow and ice from their own facilities.

1. All salt spreading equipment, whether designed to spread dry road salt, pre-wet road salt or salt brine, must be calibrated at least annually. Whenever the hydraulics on a truck are adjusted or repaired, the spreader equipment will need recalibration. Records of the calibration results must be maintained for each piece of spreading equipment. Proper calibration of equipment can reduce salt application by 50% or more, depending upon how far out of calibration the equipment was originally.
2. Using pre-wet road salt allows an agency to reduce salt application rates by 30%. Pre-wetting can be accomplished in two ways – by applying liquids to the salt stockpile, or by applying liquids by way of the spreading equipment as the salt is deposited on the road. It is generally accepted that the second method is more efficient, but requires modification to spreading equipment, and that an agency have storage capacity for liquid chemicals (most typically salt brine, but other chemicals can also be used). Agencies must make use of pre-wetting, either using treated salt in the stockpile, or preferably by use of liquids applied on the truck during the spreading process.
3. The quantity of salt applied to the road should vary according to the pavement temperature. Accordingly, agencies must have equipment that allows them to measure

the pavement temperature. While it may take some time to equip the complete winter maintenance fleet with temperature measuring devices, agencies must, at the start of the variance period, have pavement temperature sensors on enough vehicles to provide operational information during storms that allow salt application rates to be adjusted to the most efficient levels.. This requirement is a pre-requisite for the requirement detailed in item 4 below.

4. Agencies should adopt or develop a chart with suggested application rates that are a function of storm type and pavement temperature. An example of such a chart is available in the *"Manual of Best Management Practices for Road Salt in Winter Maintenance"* referenced above. Additionally, agencies should develop a methodology whereby they can determine whether each truck in their fleet applied salt at the recommended rate, and if not, why the variation from the recommended rate occurred and what needs to be changed in their procedures to be sure that the variation only occurs when strictly necessary. Varying application rates according to pavement temperature allows for reductions in total applications of as much as 50% or more.
5. As pavement temperatures decline, salt takes longer to go into solution and thus to become effective. Practice has shown that once pavement temperatures drop below 15° F the time for salt to go into solution is such that it is often plowed off the road by subsequent operations before it can be effective. Clearly, this is not an optimal use of road salt. Agencies must develop procedures for those rare situations when pavement temperatures drop below 15° F, including methods to track when these situations occur and what actions were taken under these extreme conditions. Avoiding application of salt in conditions where pavement temperatures are too low obviously results in a 100% reduction in salt usage for those conditions.
6. Agencies must have in place a methodology to track how much road salt was applied during each storm, together with some measure of how operationally severe the storm was. While this methodology does not result in a reduced application rate *per se*, it does address the issue that "if you do not measure it you cannot manage it."
7. Anti-icing has been shown to allow agencies to achieve their desired levels of service using about a quarter of the salt that a more traditional de-icing operational strategy requires to achieve the same levels of service (i.e. as much as a 75% reduction in salt application totals). Accordingly, agencies must develop a plan with clearly delineated milestones for the implementation of anti-icing in their agency.
8. All employees involved in winter maintenance operations must undergo annual training in best practices in the use of road salt in such operations. Annual training in snow and ice management is required under the State MS4 permit.

4.2.3.2 Status Review of BMP Adoption

In 2016, the DRSCW sent questionnaires to all agencies responsible for winter transportation management in the Upper DuPage River and Salt Creek watersheds (County DOTs, Municipal Public Works, Township Highway Departments, Illinois Tollway, and Illinois DOT). Twenty-two agencies in the Lower Salt Creek planning area responded. Their responses are summarized below.

Salt Storage

- All 22 respondents had a storage area; 15 reported a single storage area; 7 reported two or more.

The responses indicated the following salt storage practices:

- Four of the 22 respondents reported having a storage area that was not enclosed.
- One agency reported not having an imperious pad.
- Five agencies reported piles that were not stored in permanent structures.
- Nineteen agencies reported protocols for sweeping up spills around storage; 3 did not.
- 21 reported tarping or other protection for excess salt.

Equipment Calibration

- 19 agencies reported equipment calibration with one reported calibration following equipment repairs.
- 3 agencies reported not performing calibration activities.

Deicing, Anti-Icing, Pre-Wetting, and Deicing Agents

Information about deicing, pre-wetting, and anti-icing practices, as well as the deicing agents used, was requested in the survey. The following is a list of deicing agents used by respondents:

- 14 agencies reported using pre-wetting of solids.
- 10 agencies reported using anti-icing.
- 6 agencies reported no use of liquid at all.
- 19 agencies still use dry rock salt in some form.

In most cases, the anti-icing program included occasional pre-salting or liquid application in priority locations. This suggests an increase in the number of agencies implementing anti-icing practices watershed wide.

The 2016 survey asked about liquid anti-icing mixes. Generally, most respondents using liquids make on site a blend of 70% - 90% salt brine and 10% - 30% beet juice, pre-manufactured liquid, and/or calcium chloride.

Road Temperature Data Collection

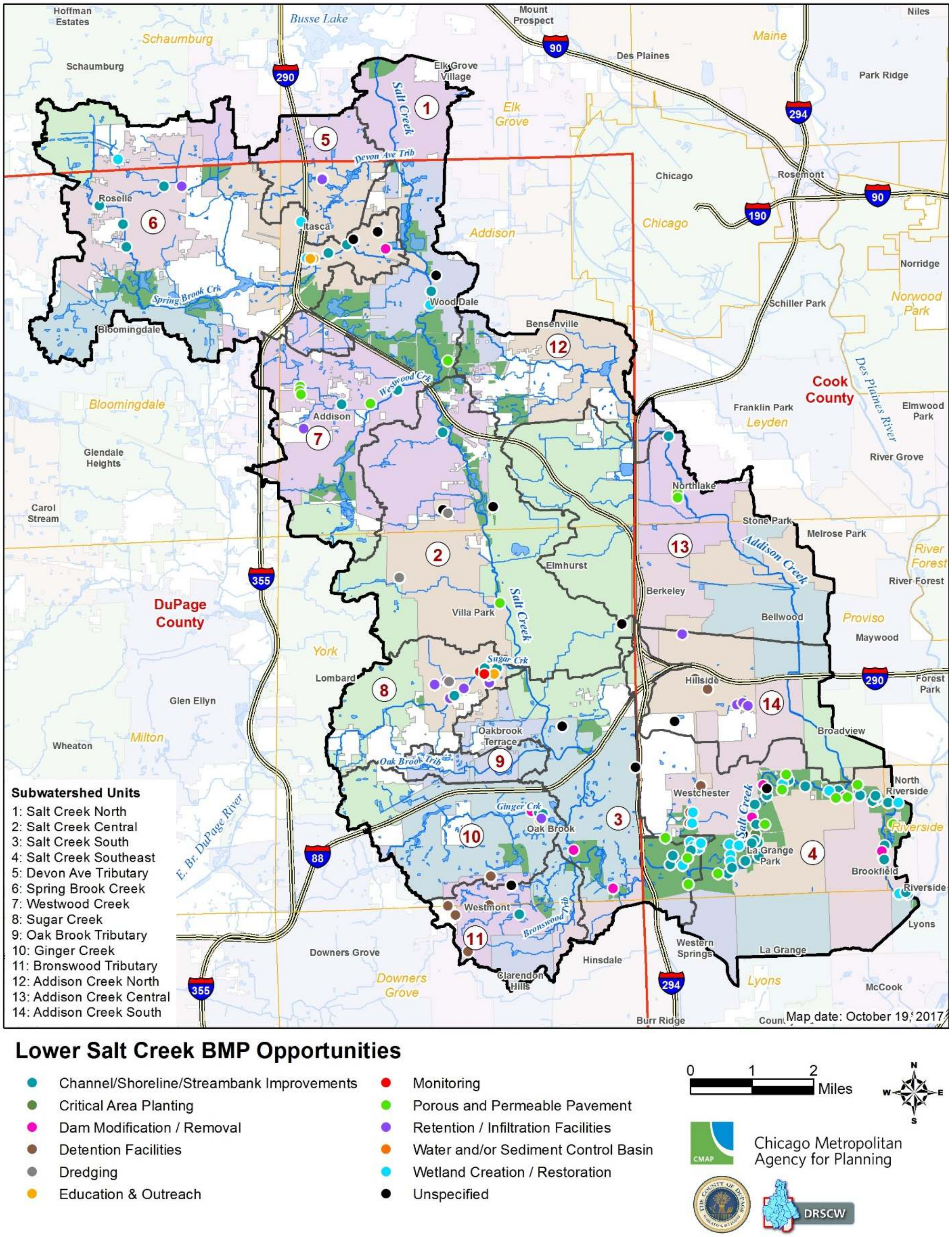
- 14 agencies reported using pavement sensor equipment and data, 8 agencies reported not using it.

Application Rates

Only 12 of the 22 respondents reported their application rates. For a snowfall of 3” the most common application rate is in the range of 200-300 pounds per lane mile (11 agencies), with one reporting 300-400 pounds per lane mile.

4.2.4 Site-Specific BMPs

Project submittals ongoing. Section to be completed…



4.2.5 Summary of Watershed-wide and Site-specific BMP Implementation Projects

4.2.6 Summary of Pollutant Loads and Potential BMP Pollutant Load Reductions

4.3 Public Information, Education, and Outreach

Community engagement, education, and outreach are essential components of any watershed protection efforts. Such activities are crucial to the implementation of a watershed plan since they:

- Raise awareness of local water resource issues and foster support for solutions;
- Provide tools to help motivate changes in behavior among stakeholders and other targeted audiences;
- Provide engaged stakeholders with the necessary tools to become watershed stewards and help implement the watershed plan;
- Leverage partnerships among stakeholders and other public and private entities to implement watershed recommendations.

Effective education and outreach is crucial to a watershed plan's success since many watershed problems often result from human actions and solutions. Furthermore, the general public is often unaware of the impact their day-to-day activities have on watershed health and solutions are often voluntary. Education and outreach activities can help raise awareness of threats to local water resources and help motivate changes in behavior to improve watershed health and water quality.

There are a number of strategies that may be appropriate to conduct successful outreach and education campaigns. This section of the plan identifies the types of targeted audiences, priority education topics, potential outreach activities, and partners to help implement these actions.

4.3.1 Resources for Watershed Information and Education Outreach Campaigns

There are many resources available to assist in developing an effective watershed information and education outreach campaign. U.S. EPA's *Getting in Step: a Guide for Conducting Watershed Outreach Campaigns* (2003) and CMAP and Illinois EPA's *Guidance for Watershed Action Plans in Illinois* (2007) are two recommended sources. Not-for-profit organizations provide information, outreach materials, volunteer opportunities, and other resources applicable to watershed protection. These organizations include the nationally renowned Center for Watershed Protection (CWP) and Center for Neighborhood Technology (CNT) along with a wide range of local organizations such as The Conservation Foundation, School & Community Assistance for Recycling and Composting Education (SCARCE), Environment and Nature Training Institute for Conservation Education (ENTICE), Chicago Zoological Society (CZS), Sierra Club, Illinois Paddling Council, Kane-DuPage Soil and Water Conservation District, North-Cook Soil and Water Conservation District, Salt Creek Watershed Network, DuPage River Salt Creek Workgroup (DRSCW), and many others.

4.3.2 Tools to Conduct a Successful Outreach Campaign

4.3.2.1 Establishing a Sense of Place

People will feel more connected and protective of a place, in this case local watersheds, if they know when they are in that place and why it is special. There are many features within the Salt Creek Watershed planning area including rich and rare ecosystems, regional trails, vast scenic landscapes, and both urban and rural character that help make these watersheds a special place. Outreach activities should be designed to help foster a sense of place among community members and visitors.

4.3.2.2 Identifying and Understanding the Audience

Identifying the targeted audience (s) based on their ability to implement actions of the watershed plan is an essential first step in conducting a successful outreach campaign. Once identified, targeted audiences should be broken down into the smallest segment possible to achieve the best results. Messaging should be created that resonates with the targeted audience and inspires them to act. Targeted audiences for future outreach campaigns include the following:

- **Volunteers**: local residents, environmental organizations interested in managing water resources within the watershed.
- **Residents and Landowners:** local residents, homeowners associations, businesses, institutions, civic organizations.
- **Government officials and agencies:** municipalities, townships, counties, forest preserve and conservation districts, park districts, schools, library districts, drainage districts.
- **Land and resource managers and organizations:** environmental organizations, homeowners associations, lake management associations, business and institutional

facility managers, nurseries, agricultural producers, environmental organizations, special interest groups.
- **Developers:** contractors, consultants, developers, and homebuilders working in the watershed.
- **Students:** primary and secondary schools in the planning area.

Knowing some information about the target audience(s) is essential. Campaign audiences have varied values and beliefs, and they will not necessarily be the same as those implementing the watershed plan. The following is a list of a few questions that are important to know about the target audience(s), before education and outreach activities begin:

- What does the audience know already?
- What are their existing beliefs and perceptions?
- How does the audience receive messages and information?
- What will make the audience change their behavior?
- Other important factors include education, age, culture, and religion.

In order to create a successful education and outreach campaign, it is necessary to understand the audience(s). What causes the audience to engage in the behaviors we want to change? How can we most effectively convey that message to them? How can we motivate the audience(s) to change? The understanding of the audience can be completed at the same time or subsequent to identifying the audience(s). Surveys, focus groups, and even simple observations can lead to a greater understanding of the audience and a successful campaign.

4.3.2.3 Setting Outreach Priorities for Targeted Audiences

Once the targeted audience has been identified and understood, outreach priorities and activities for targeted audiences should be identified. These should directly support the watershed management plan's goals thereby aiding successful plan implementation. Stakeholders identified the following goals, which serve as priority topics for education and outreach activities.

- Improve and protect the ecological integrity of surface water resources to attain or maintain designated uses of aquatic life support, fish consumption, primary contact, and aesthetic quality.
- Protect, restore, and expand natural areas and increase native aquatic and terrestrial plant and animal species diversity.
- Reduce flooding and attendant streambank and shoreline erosion and infrastructure risk through initiatives to improve and protect water quality.
- Continue to build, strengthen, and support local partnerships and expertise to protect streams, lakes, and wetlands via plan implementation.
- Continue to raise public awareness and increase understanding of the impacts of land use and land/water management decisions on water and habitat quality, and further encourage implementation of watershed protection practices.

4.3.2.4 Choosing Message Formats and Delivery Methods

There are a number of communication tools to help support successful outreach campaigns. Each may be customized to support the education effort and help foster relationships and a sense of community, build understanding, and motivate people to action. A number of formats may be used including those listed in Table 60.

Table 60. Communication tools for education and outreach campaigns.

Printed	*Electronic*	*Visuals*	*Events*	*Other*
• Brochures • Posters • Flyers • Mail surveys • Fact sheets • Manuals & other technical resources • News releases • Newsletters • Bumper stickers • Promotional items	• Websites • Social media (e.g., Facebook, Twitter) • Bulletin boards • Watershed wikis • Web syndications (podcasts, RSS feeds) • Public service announcements (TV, radio) • Picture Post*	• Signage • Exhibits • Demonstration projects • Bulletin boards • Presentations • Storm drain stenciling	• Focus groups • Field trips • Classes • Cleanup events • Restoration field days • Hands on events • Public hearings & meetings	• DuPage River Salt Creek Workgroup • Salt Creek Watershed Network • Partnerships • Cooperative agreements • Local ordinances • Comprehensive plans

4.3.2.5 Selecting Program Activities for Targeted Audiences

Once the targeted audience has been identified and outreach priorities, messages, and delivery formats determined, an outreach strategy should be developed. It should include priority topics, targeted audiences, vehicles to communicate the messages, and potential partners to lead information and education outreach efforts. Several information and education opportunities to support each of this plan's goals are summarized in Table 61.

Table 61. Existing and potential information and education opportunities by Lower Salt Creek Watershed-based Plan goal.

Targeted Audience	*Existing and Potential Opportunities*	*Potential Partners*
Goal: Improve and protect the ecological integrity of surface water resources to attain or maintain designated uses of aquatic life support, fish consumption, primary contact, and aesthetic quality.		
-Volunteers	Conservation@Home and Conservation@Work encourages use of ecofriendly landscapes among landowners. The program recognizes the importance of native plants and their effect on water resources. The Conservation Foundation (TCF) provides a detailed guide to making and maintaining rain gardens and rain barrel installation. They also sell discounted rain barrels year round.	-The Conservation Foundation (TCF)
-Volunteers -Students	Increase citizen knowledge through the Illinois Volunteer Lake Monitoring Program (VLMP). Data used from the program is used to document water quality impacts to local lakes and aid in lake management decision-making.	-Illinois EPA -CMAP
-Volunteers -Students	Through the Illinois River Watch Program, volunteers can become "citizen scientists" and conduct habitat and biological surveys on streams. The macroinvertebrates collected are used as bio-indicators of water quality.	-The National Great Rivers Research and Education Center
-Volunteers -Residents -Landowners -Businesses	The Salt Creek Watershed Network's website includes educational resources about watersheds, and how residents, landowners and businesses can protect water systems.	-Salt Creek Watershed Network
-Volunteers -Residents -Landowners -Businesses	The DuPage River Salt Creek Workgroup (DRSCW) is performing in a number of monitoring programs and remediation projects in order to protect the watershed. Some of their projects involve bio-assessment, chlorides, dissolved oxygen, nutrient management, etc.	-DRSCW
-Residents -Landowners -Businesses	The WaterSense Program promotes the need for water efficiency by offering alternatives to use less water with water efficient products.	-US EPA -Northwest Water Planning Alliance
-Volunteers	The DuPage County River Sweep is an annual self-coordinated stream cleanup and restoration event. The river sweep involves volunteers helping to clean up the rivers and streams by picking up garbage and debris in and along the local waterways and restoring nearby land back to its natural state.	-TCF -DuPage County
-Residents -Landowners -Businesses	DuPage County Water Quality Collector Web App is an online citizen reporting tool that allows residents, landowners, and businesses to document various waterway issues in the area. Some of the reported issues include stream blockage, streambank erosion, sediment and water quality issues. The web app tool documents the reported issues and informs the county about the issues.	-DuPage County Stormwater Management

-Residents -Landowners -Businesses	DuPage County Stormwater Management's website provides a number of educational resources that have been developed to protect the quality of groundwater and conserve water.	-DuPage County Stormwater Management
Goal: Protect, restore, and expand natural areas and increase native aquatic and terrestrial plant and animal species diversity.		
-Residents -Landowners -Businesses	The Forest Preserves of Cook County (FPCC) seeks to protect, restore, and expand natural areas within the County. The FPCC offers a number of education and special events aimed at its mission, and owns or manages numerous natural areas. The FPCC partners with the Chicago Zoological Society to conduct plant and animal species conservation efforts.	-Forest Preserves of Cook County -Chicago Zoological Society (Brookfield Zoo)
-Residents -Landowners -Businesses	The Forest Preserve District of DuPage County (FPDDC) seeks to protect, restore, and expand natural areas within the DuPage County. The FPDDC offers a number of education and special events aimed at its mission, and owns or manages numerous natural areas.	-Forest Preserve District of DuPage County
Goal: Reduce flooding and attendant streambank and shoreline erosion and infrastructure risk through initiatives to improve and protect water quality.		
-Residents -Landowners -Government Officials -Government Agencies	Meetings, local government websites, school websites, newsletters, email blasts, workshops, demonstration projects, public meetings, streambank and shoreline assessments.	-Elected Officials -Park & forest preserve districts -Non-Profit Groups -Landscape Contractors -Homeowner's Associations
-Government Officials -Government Agencies	Develop a regional floodplain management plan. Potential benefits of the plan include: reduction of flood damage costs to communities; improvement of riparian vegetation, wildlife habitat and water quality; retention of natural beauty in the area.	-FEMA
-Government Officials -Government Agencies	Develop a local stormwater or floodplain management plan. Potential benefits of the plan include: reduction of flood damage costs to communities; improvement of riparian vegetation, wildlife habitat and water quality; retention of natural beauty in the area.	-DuPage County -Cook County -MWRDGC -Municipalities
-Government Officials	Village newsletters may be used by local governments to tie the educational component of their MS4 program to this watershed plan and its implementation such that	-Elected Officials -Illinois EPA

-Government Agencies	collaborative efforts might benefit from a consistent message and efficiencies to be gained from cooperation.	
-Volunteers -Residents -Landowners -Government Officials -Government Agencies -Land Resource Managers -Developers	Targeted mailings, county/municipal websites, home owner's association workshops, handouts at permit facilities, local codes, ordinances	-Elected Officials -DuPage County -Cook County -MWRDGC -CMAP
Goal: Continue to build, strengthen, and support local partnerships and expertise to protect our streams and lakes via plan implementation.		
-Government Officials -Government Agencies -Land Resource Managers -Non-Profit Organizations	CMAP's Local Technical Assistance (LTA) Program provides assistance to local governments, nonprofits, and intergovernmental organizations to address sustainable development.	-CMAP
-Government Officials -Government Agencies	Municipal/Technical Training in the form of a variety of workshops that teach BMPs for stormwater management and stream restoration.	-TCF -DuPage County Stormwater Management
-Volunteers -Residents -Students	SCARCE is a non-profit in DuPage County that focuses on providing hands-on environmental education programs for schools and organizations. SCARCE also hosts several community-wide events focused on public outreach about environmental stewardship and sustainability. SCARCE offers a program that teaches K-12 students about the 'Enviroscape Watershed Model' that identifies point and NPS pollution.	-School & Community Assistance for Recycling and Composting Education (SCARCE)
-Volunteers -Residents -Students	Environmental and nature related professional development training/workshops that provide educators information about natural resources, as well as supplement materials and instructional methods to incorporate into lessons with students. The trainings/ workshops are meant to promote stewardship of natural resources.	-Environment and Nature Training Institute for Conservation Education (ENTICE) -Illinois Dept. of Natural Resources' (IDNR)

		Division of Education
-Volunteers -Residents -Students	Zoo Adventure Passport (ZAP!) is a free program offered through the Brookfield Zoo that gives families with young children the opportunity to explore the natural world through hands-on, real-life learning experiences.	-Chicago Zoological Society (Brookfield Zoo) -Chicago Public Library
-Volunteers -Residents -Students	The Mighty Acorns® program incorporates classroom curriculum, hands-on restoration activities and exploration as it seeks to provide children with multiple, meaningful, sustained interactions with the land. Classes adopt a natural area in their community and visit it throughout the school year in order to participate in stewardship activities. Each field trip is preceded by a classroom lesson on related ecological concepts.	-TCF
-Volunteers -Residents -Students	The Kane-DuPage Soil & Water Conservation District (SWCD) provides several outreach programs for K- 12 classrooms, home schools, and boy/girl scout groups. Programs are interdisciplinary, aligned to the state learning standards, and can be designed to meet the needs of classroom curriculum. Possible outreach program topics include, but are not limited to, changing landscapes, land and water conservation, soils, trees, and stewardship.	-Kane-DuPage SWCD
-Volunteers -Residents -Students	The North Cook Soil & Water Conservation District (SWCD) provides youth workshops and stewardship opportunities.	-North Cook SWCD
Volunteers	Water Sentinels is a Sierra Club program that deals with water related issues across the country. The program explores the ways in which waterways are impacted by pollution, climate, and development, while also actively working to empower local activists with accurate information and training them in water-quality monitoring techniques and grassroots advocacy.	-Sierra Club
Volunteers	Illinois Water Trailkeepers of the Illinois Paddling Council take on a stewardship responsibility with paddleable waterways in Illinois. The Trailkeepers monitor and maintain several water bodies in the state, including the Des Plaines River and Salt Creek. They perform the needed stewardship tasks specific to each body of water.	-Illinois Paddling Council
Goal: Continue to raise public awareness and increase understanding of the impacts of land use and land/water management decisions on water and habitat quality, and further encourage implementation of watershed protection practices.		

-Students -Residents -Landowners -Government Officials -Government Agencies	Print, Electronic, Visuals, Events, and other tools (see table below)	-Municipalities -Townships -Library Districts -Park & Forest Preserve Districts -Primary & Secondary Schools -SWCDs -CMAP -TCF -SCARCE
-Residents -Landowners -Businesses	Storm Drain Stenciling is a social marketing technique used to educate and remind the public not to dump waste into storm drains in order to avoid runoff and to help keep our waterways clean.	-TCF -SCARCE -Residents -Homeowners Associations -School Groups -Scouting Groups -Church Groups -Service Organizations
-Students -Residents -Landowners -Government Officials -Government Agencies	*Love Blue. Live Green*. is a campaign that promotes the DuPage County mission to protect and enhance the quality of streams and rivers within the county. The social media campaign platforms provide updates, newsletters, and educational resources about local waterways, and how residents, landowners and businesses can protect them.	-DuPage County
-Schools -Businesses -Churches -Park Districts -Library Districts -Municipal Organizations -Non-Profit Organizations	The Water Quality Flag program encourages schools, businesses, churches, etc. to participate in activities that promote water quality by providing a water quality flag when they complete two activities. Some of these activities include, but are not limited to, installing storm drain markers, planting rain gardens, and installing rain barrels. The water quality flag is both an incentive and a symbol of commitment to water quality.	-SCARCE -DuPage County
-Schools -Businesses -Churches -Park Districts -Library Districts -Municipal Organizations -Non-Profit Organizations	Picture Posts are wooden markers installed in natural areas that help guide visitors to photograph a location in different orientations at different times. Photos are dated, geotagged, uploaded, and shared to allow for environmental monitoring, as well as to increase public awareness of a site. Picture Posts are accessible to anyone, and are easy to install, use and maintain.	-DuPage County -Cook County -Municipalities -Park & Forest Preserve districts

4.3.3 Recommendations and Cost Estimate

Several recommendations for public information, education, and outreach activities within the Salt Creek planning area are listed below.

1. Local conservation-oriented organizations and agencies as well as local governments should promote the Lower Salt Creek Watershed-based Plan and its recommendations in either special or regularly occurring communications with members and residents.
2. CMAP should issue a press release about the Lower Salt Creek Watershed-based Plan upon approval by Illinois EPA.
3. A social survey should be conducted to help determine barriers to and pathways for greater stakeholder participation. (DuPage County Stormwater Management last conducted such a survey in 2013 and 2014.)
4. County, township, and municipal governments should create a dialogue with neighborhood and/or homeowner's associations to raise awareness of stormwater management issues and responsibilities, in collaboration with local conservation-oriented organizations, educational providers, and stormwater professionals. Workshops on maintaining stormwater BMPs should be offered for HOAs and other property owners responsible for their maintenance.
5. County, township, and municipal governments should promote installation of rain gardens, rain barrels, and other property-level green infrastructure practices by neighborhood and/or homeowner's associations and local businesses, in collaboration with local conservation-oriented organizations, educational providers, and professionals in the field.
6. Municipal and other local government staff should incorporate NWPA recommendations and related requests for data sharing and information.
7. Local governments and nongovernmental organizations alike should promote:
   a. use of phosphorus-free lawn fertilizer by homeowners and other private individuals who maintain their lawns (i.e., noncommercial or non-for-hire applicators),
   b. use of on-demand water softeners by homeowners and other private individuals and businesses,
   c. a pet waste disposal campaign.
8. The Conservation Foundation/DRSCW and partner agencies should continue to offer their "sensible salting workshops" and conduct campaigns to encourage workshop participation and ongoing implementation.

4.4 Funding and Technical Assistance

Plan implementation is largely based on the availability of funding and/or technical assistance for implementation projects and other plan recommendations. Table 62 describes several potential grant funding and technical assistance resources that may be used to assist with plan implementation.

HH – update table – look at table DCSM sent…

Table 62. Funding and technical assistance resources.

Program	*Funding Agency*	*Funding Amount*	*Eligibility*	*Activities Funded*	*Website*
Clean Water and Drinking Water State Revolving Loan Funds	U.S. EPA	Loan Program	Local government, individuals, citizens (septic systems), not-for-profit groups	Green projects, wastewater treatment, NPS, watershed management, restoration and protection of groundwater.	http://www.epa.gov/aboutepa/about-office-water
Conservation Innovation Grants	USDA - NRCS	Up to $75,000 under state component	Landowners, organizations	Projects targeting innovative on-the-ground conservation, including pilot projects and field demonstrations.	http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/
Conservation Stewardship Program	USDA - NRCS	Not more than $200,000	Private and tribal agricultural lands, grassland, rangeland, pastureland, and nonindustrial private forest land	The program helps agricultural producers maintain and improve their existing conservation system.	
Environmental Quality and Incentives Program (EQIP)	USDA - NRCS	Advance payment of up to 50%	Agricultural producers, private owners	Resource limited farmers receive an increased payment rate to purchase equipment/materials to implement conservation practices.	
Healthy Forests Preserve Program	USDA - NRCS	50%, 75% or 100% of the enrolled land/ cost of conservation practice. Funding based on 10-year or 30-year contract	Private landowners	The program offers 10-year restoration agreements and 30-year permanent easements for specific conservation actions.	

Program	*Funding Agency*	*Funding Amount*	*Eligibility*	*Activities Funded*	*Website*
FEMA Hazard Mitigation Buyout Program	FEMA	Market value of the real property (land and structures) at the time of sale or immediately prior to the flood event	Private landowners	The program provides assistance to property owners to purchase a flood-prone structure from the owner in order to restore and/or conserve the natural floodplain functions.	http://www.fema.gov/media-library/assets/documents/13664?id=3324
Illinois Clean Lakes Program	Illinois EPA	Phase 1: $75,000 Phase 2: $300,000 When funding is appropriated.	Owners/managers of lakes that have public access.	Two types of grants are awarded: Phase I identifies problems and sources of pollution. Phase II grants support implementation or procedures recommended in the Phase I report to improve water quality.	www.epa.state.il.us/water/conservation/iclp.html
Illinois Green Infrastructure Program	Illinois EPA	Small: $75,000 Retention: $750,000 CSO: $3M When funding is appropriated	Any entity eligible to receive funds from the state And the project is in a MS4 community.	Implementation of green infrastructure BMPs that are designed to improve water quality to lakes, rivers and streams through managing stormwater to reduce flows and remove pollutants.	http://www.epa.gov/green-infrastructure
Local Technical Assistance (LTA) Program	CMAP	--	Local governments, nonprofits, intergovernmental organizations.	Technical assistance is provided to address local issues including transportation, landuse, housing, natural environment, economic growth and community development.	http://www.cmap.illinois.gov/programs-and-resources/lta/
Nonpoint Source Management Program (319)	Illinois EPA	No set limit on awards	Any entity that has legal status to accept funds from the state of Illinois, including state and local governmental units, nonprofit organizations, citizen and environmental groups, individuals, businesses.	Green Infrastructure best management practices for stormwater management to protect or improve water quality.	http://www.epa.illinois.gov/topics/water-quality/watershed-management/nonpoint-sources/grants/index

Program	*Funding Agency*	*Funding Amount*	*Eligibility*	*Activities Funded*	*Website*
Open Space Lands Acquisition & Development & Land & Water Conservation Programs	Illinois DNR	$750,000 acquisition $400,000 development	---	The program provides funding for water quality basins with native plantings, preservation/biological improvement of permanent wetlands, interpretive prairie gardens, etc.	www.dnr.state.il.us/
Project Quercus	The Land Conser-vancy of McHenry County	--	Homeowners, businesses, governmental units, education institutions, individuals	The program sells container-grown oaks from the Glacier Oaks Nursery in Harvard, IL.	http://www.conservemc.org/
Streambank Cleanup and Lake Shore Enhancement (SCALE) grants	Illinois EPA	$3,500	Any entity eligible to receive funds from the state.	Provides funds to assist groups that have established a recurring stream or lakeshore cleanup.	www.epa.state.il.us/water/watershed/scale.html
Sustainable Agricultural Grant Program	Illinois Dept. of Ag.	Up to $10,000 for individuals Up to $20,000 for units of government, non-profits, institutions.	Organizations, governmental units, educational institutions, non-profit groups, individuals	Practices are aimed at maintaining producers' profitability while conserving soil, protecting water resources and controlling pests through means that are not harmful to natural systems, farmers or consumers.	https://www.agr.state.il.us/conservation-2000/

5. Monitoring Success

Although there is considerable merit in producing a watershed-based plan, actual protection and improvement in water quality in the Lower Salt Creek Watershed planning area will be a result of implementing the plan’s various project, program, planning, policy, and I/E outreach recommendations. Improving water quality will happen over time and with considerable effort by all with a stake in watershed health including residents, local governments, agencies, organizations, and the business community.

5.1 Implementation Schedule

Table 63. General 10-year plan implementation schedule.

Task	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 6*	*Year 7*	*Year 8*	*Year 9*	*Year 10*	*(Year 11)*
Conduct outreach to elected officials & general public about the Lower Salt Creek Watershed-based Plan, including funding & tech assist opportunities	X		X		X		X		X		
Identify a series of plan recommendations to implement	X	X		X	X		X	X			
Identify available grant funding and tech assistance programs	X	X	X	X	X	X	X	X	X	X	
Develop and submit grant and tech assistance applications	X	X	X	X	X	X	X	X	X	X	
Implement on-the-ground, policy & planning, and education and outreach projects and programs		X	X	X	X	X	X	X	X	X	
Keep track and report progress to DRSCW	X	X	X	X	X	X	X	X	X	X	
Communicate success stories	X	X	X	X	X	X	X	X	X	X	
Evaluate accomplishments		X		X		X		X		X	
Update the watershed-based plan										X	X

5.1.1 Interim Measureable Milestones

One requirement of a watershed-based plan is to establish interim measurable milestones for determining whether nonpoint source pollution management measures and other actions are being implemented. Table 64 identifies such milestones and ties them to goals that stakeholders established during the planning process. Stakeholders will evaluate progress towards measurable milestones on an annual basis such that it will become clear where improvements and/or changes to an approach or the plan itself are needed. It is important, therefore, for a clear sense of progress to be documented.

Plan recommendations will require local commitments, resources, and collaboration for implementation success. While there are several sources of funding made available throughout the year, the Clean Water Act Section 319 grant program, administered by Illinois EPA, is a particularly important one for local stakeholders to pursue.

Table 64. Interim measureable milestones.

Goal	*Indicator*	*Two-year milestone*	*Five-year milestone*	*Ten-year milestone*
Improve and protect the ecological integrity of surface water resources to attain or maintain designated uses…	Lin. ft. vegetated swales			
	No. of rain gardens			
	No. of rain barrels			
	No. of dry detention basin retrofits			
	No. of wet detention basin retrofits			
	Acres permeable pavement			
	Lin. ft. streambank stabilization			
	Lin. ft. shoreline stabilization			
	Acres new riparian buffer			
	Acres restored riparian buffer			
	Acres restored wetlands			
	No. of site-spec. ag. BMPs			
	No. of public sector trees planted			

Protect, restore, and expand natural areas and open space, and increase native aquatic and terrestrial plant and animal species diversity	Acres placed in new, permanent conservation status			
	Acres ecological habitat restoration			
Reduce flooding and attendant bank erosion and infrastructure risk through initiatives to improve and protect water quality	No. of home buy-outs replaced with infiltration facility			
	Acres green roof			
	Acres blue roof			
	Acres floodplain reconnection			
Continue to build, strengthen, and support local partnerships and expertise to protect our streams, lakes, and wetlands via plan implementation	No. of presentations made to elected officials			
	No. of presentations made to community groups			

Continue to raise public awareness and increase understanding of the impacts of land use and land/water management decisions on water and habitat quality…	No. of communities whose comprehensive plans/updates support water quality protection in new and retrofit design practices			
	No. of communities whose ordinance updates improve water quality protections			
	No. of road maintenance departments participating in "sensible-salting" training / retraining			
	No. of contractors participating in "sensible-salting" training / retraining			
	No. stream cleanup events			
	No. of public presentations, displays, and/or field trips with Lower Salt Creek Plan implementation theme			
	No. of newsletter articles with Lower Salt Creek Plan implementation theme			
	No. of Conservation@Home and/or Conservation@Work installations			
	No. of students enrolled in local college "green curriculum" courses			
	No. of active volunteer lake and stream monitors			

5.2 Criteria for Determining Progress

Gauging progress and success with the plan depends largely on how many of the plan recommendations are implemented. Progress made with implementing BMP recommendations should eventually translate to improved water quality and subsequent attainment of designated uses and/or water quality standards.

Monitoring pollutant-load reductions and biological index scores will be the primary criterion by which progress can be judged. Table 65 identifies criteria of determining progress within five and ten-year timeframes to reflect the fact that it will take time to see improvements manifest in response to plan implementation.

Another important criterion for determining progress will be delisting of a waterbody due to use attainment as documented in the biennial integrated water quality reports. Thus, improvements in water quality should result in greater use attainment and/or delisting [Section 303(d)] in the 2028 Integrated Report.

Table 65. Criteria for determining progress in load reductions and attaining or maintaining water quality standards or criteria.

Criteria	*Current Load, Score, or Rating*	*Target within 5 years*	*Target within 10 years*
Watershed-wide			
Nitrogen load reduction	lb/yr	5% load reduction = lb/yr (lb total)	15%* load reduction = lb/yr (lb total)
Phosphorus load reduction	lb/yr	10% load reduction = lb/yr (lb total)	25%* load reduction = lb/yr (lb total)
Sediment load reduction	t/yr	10% load reduction = t/yr (t total)	25% load reduction = t/yr (t total)
BOD load reduction	lb/yr	5% load reduction = lb/yr (lb total)	15% load reduction = lb/yr (lb total)
Chloride load reduction (road deicing practices)	t/yr	25% load reduction = t/yr (t total)	50% load reduction = t/yr (t total)
No. of fish species in greatest need of conservation		≥	≥

Criteria	*Current Score or Rating*	*Target within 5 years*	*Target within 10 years*
Waterbody-specific			
Salt Creek (IL_GL_10)			
fIBI score			
mIBI score			
QHEI score			
Salt Creek (IL_GL_03)			
fIBI score			
mIBI score			
QHEI score			
Salt Creek (IL_GL-09)			
fIBI score			
mIBI score			
QHEI score			
Salt Creek (IL_GL-19)			
fIBI score			
mIBI score			
QHEI score			
Addison Creek (IL_GLA-04)			
fIBI score			
mIBI score			
QHEI score			
Addison Creek (IL_GLA-02)			
fIBI score			
mIBI score			
QHEI score			
Meacham Creek (IL_GLBA)			
fIBI score			
mIBI score			
QHEI score			
Spring Brook Creek (IL_GLB-01)			
fIBI score			
mIBI score			
QHEI score			
Spring Brook Creek (IL_GLB-07)			
fIBI score			
mIBI score			
QHEI score			
Swan Lake (WGZY) – annual average total phosphorus conc.	mg/L	---	≤0.050 mg/L
Lake Charles (RGR) – annual average total phosphorus conc.	mg/L	---	≤0.050 mg/L

*percent reduction matches Illinois Nutrient Reduction Strategy year 2025 goal

5.3 Monitoring to Evaluate Effectiveness

Salt Creek

- Illinois EPA and Illinois DNR Des Plaines River Basin survey – water quality, habitat, macroinvertebrates, fish – every 5 years (next scheduled in 2017)
- DRSCW – water quality monitoring annually; habitat, macroinvertebrates, fish – every 3 years (last in 2016, next in 2021)

Tributaries

Road deicing practices

Swan Lake / Cook Co.

- Volunteer Lake Monitoring Program (VLMP) – annual Secchi transparency, water chemistry, and dissolved oxygen/temperature monitoring

Lake Charles / DuPage Co.

- Volunteer Lake Monitoring Program (VLMP) – annual Secchi transparency, water chemistry, and dissolved oxygen/temperature monitoring

Public knowledge

- DCSM Water Quality Survey (first conducted in 2013, last conducted in 2014)

List of Acronyms

HH: to be updated…

ADID: Advanced Identification [of wetlands]
ALMP: Ambient Lake Monitoring Program
BMP: Best Management Practice
BOD: Biological Oxygen Demand
CL: Chloride
CMAP: Chicago Metropolitan Agency for Planning
CNT: Center for Neighborhood Technology
CWP: Center for Watershed Protection
CWS: Community Water System
DNR: Deparment of Natural Resources
EDMC: Environmental Defenders of McHenry County
EPA: Environmental Protection Agency
FEMA: Federal Emergency Management Agency
fIBI: fish Index of Biotic Integrity
FIRMs: Flood Insurance Rate Maps
FOFR: Friends of the Fox River
FREP: Fox River Ecosystem Partnership
GIV: Green Infrastructure Vision
HEL: Highly erodible land
HOA: Homeowner's Association
HSGs: Hydrologic Soil Groups
IEMA: Illinois Emergency Management Agency
IFDA: Illinois Forestry Development Act
IGPA: Illinois Groundwater Protection Act
INAI: Illinois Natural Area Inventory
INPC: Illinois Nature Preserves Commission
ISWS: Illinois State Water Survey
IWAP: Illinois Wildlife Action Plan
LTA: Local Technical Assistance
LUREC: Loyola University Retreat and Ecology Campus
MBI: Macroinvertebrate Biotic Index
MCC: McHenry County College
MCCD: McHenry County Conservation District
MCSEEP: McHenry County Schools Environmental Education Program
mIBI: macroinvertebrate Index of Biotic Integrity
MS4: Municipal Separate Storm Sewer System
N: Nitrogen
NIPC: Northeastern Illnois Planning Commission
NLCD: National Land Cover Database
NOI: Notice of Intent
NPDES: National Pollutant Discharge Elimination System
NRCS: Natural Resources Conservation Service
NVSS: Nonvolatile Suspended Solids
NWPA: Northwest Water Planning Alliance
P: Phosphorus
PCBs: Polychlorinated biphenyls
QHEI: Qualitative Habitat Evaluation Index
SARA: Sensitive Aquifer Recharge Area
SMO: Stormwater Management Ordinance
SS: Site-specific
SSURGO: Soil Survey Geographic
STEPL: Spreadsheet Tool to Estimate Pollutant Loads
SWCD: Soil & Water Conservation District
TKN: Total Kjeldahl Nitrogen
TLCMC: The Land Conservancy of McHenry County
TOD: Transit Oriented Development
TP: Total Phosphorus
TSI: Trophic State Index
TSS: Total Suspended Solids
UDO: Unified Development Ordinance
USDA: U.S. Department of Agriculture
USGS: U.S. Geological Survey
UST: Underground Storage Tank
VLMP: Volunteer Lake Monitoring Program
VSS: Volatile Suspended Solids
WW: Watershed-wide
WWTP: Waste Water Treatment Plant